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ABSTRACT

These task analyses are designed to be used in combination with the "Trade and Industrial Education Service Area Resource" in order to implement competency-based education in the masonry program in Virginia. The task analysis document contains the task inventory, suggested task sequence lists, and content outlines for the secondary courses Masonry I and II. Section 1 of this publication contains a validated task inventory for masonry. For each task, applicable information pertaining to performance and enabling objectives, criterion-referenced measures, and suggested instructional activities and aids is provided. Section 2 provides descriptions of the secondary program and courses in masonry. Included with each course description is a task sequence list, which provides a suggested order of the task inventory for actual instruction, and course content outlines. The instructional topics within the outlines have been cross-referenced with the corresponding task/competency codes from the task inventory in Section 1. Also included in this document are a bibliography, list of tools and equipment, suggested audiovisual aids, suggested masonry projects, and an instructional management system checklist. (KC)

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Masonry:

Task Analyses

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Divisions of Vocational and Adult Education
Department of Education
Commonwealth of Virginia
Richmond, Virginia 23216

1985

CE051003

Review Draft

COMPETENCY-BASED
CBE
EDUCATION

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GUIDE APPLICATION

These task analyses are based on the following Dictionary of Occupational Titles (DOT) job titles contained in the occupational domain of MASONRY.

DOT Job Title	DOT Code
Bricklayer	861.381-018
Bricklayer Helper	869.687-026
Bricklayer Apprentice	861.381-022

Therefore, this document is useful in developing and selecting instructional materials and in implementing competency-based education for the following program and courses:

Program	Courses
Masonry	Masonry I (8512)
(CIP Code 46.0102)	Masonry II (8513)

Additional information concerning the application and use of this publication in program planning and development may be obtained from the following:

Trade and Industrial Education Service
Department of Education
P.O. Box 6Q
Richmond, Virginia 23216

TASK ANALYSES

FOR

MASONRY

PROJECT DIRECTOR

Mildred Andra Witten

This publication was developed by Arlington Public Schools for the Virginia Department of Education, Division of Vocational and Adult Education under the provisions of the Vocational Education Amendments of 1976 (Public Law 94 -482) and Competency-Based Education Contract #VA80-C-132-3-AD-001A, Subpart 3, Section 32, Exemplary.

1985

FOREWORD

In the next decade, businesses and industries in Virginia will require large numbers of skilled workers. Therefore, vocational education at the secondary and postsecondary levels will have the responsibility of preparing individuals for a variety of occupations.

Competency-based education (CBE) provides the preparation students need for entry into the Virginia work force. The CBE practice of recording competencies developed by students helps them to make a smooth transition between secondary and postsecondary programs when both levels of education are required for career training. In addition, CBE is effective in retraining workers who have been displaced because of changing technology.

This guide will assist teachers and administrators in developing instructional materials that meet the needs of students and industry and comply with the Virginia CBE standards for vocational and adult education.

S. John Davis
Superintendent of Public Instruction

Dewey T. Oakley, Jr.
Acting Administrative Director
Vocational and Adult Education

ACKNOWLEDGMENTS

This task analyses guide for competency-based education in Masonry is the result of a coordinated effort on the part of the project participants.

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Special recognition is given to the students of the Henrico Trade Center of the Henrico County Public Schools, Department of Vocational and Community Education. Under the supervision of William D. Burton, printing instructor, these students printed, assembled, packaged, and prepared the guide for distribution.

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Trade and Industrial Education Service
Virginia Department of Education

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INTRODUCTION

These task analyses are designed to be used in combination with the Trade and Industrial Education Service Area Resource in order to implement competency-based education in the Masonry program. The service area resource contains information that pertains to all programs within the Trade and Industrial Education area; the sections of that publication are entitled Occupational Information, Student Organization (VICA), Classroom Management Systems, and Recording Systems. This task analyses document contains the task inventory, suggested task sequence lists, and content outlines for the secondary courses, Masonry I and II. Detailed instructions for combined use of these two publications are contained within the service area resource.

USING THE TASK ANALYSES

Section 1 of this publication contains a validated task inventory for Masonry. For each task, applicable information pertaining to performance and enabling objectives, criterion-referenced measures, and suggested instructional activities and aids is provided. In this section, tasks are arranged by worker duty area only, and no attempt has been made to sequence tasks in instructional order.

Section 2 provides descriptions of the secondary program and courses for Masonry. Included with each course description is a task sequence list, which provides a suggested order of the task inventory for actual course instruction. Following the task sequence lists are course content outlines. The instructional topics within the course outline have been cross-referenced with the corresponding task/competency codes from the task inventory in Section 1.

It is suggested that the Section 2 task sequence list and course content outline be reviewed initally to make any desired changes in sequencing of instruction. Once the sequencing is confirmed, instructional planning and implementation may proceed through referral to the Section 1 task/competency sheet noted beside each instructional topic within the outline. Localities which wish to implement the three-year option available for Trade and Industrial Education programs should distribute and sequence the tasks accordingly.

SECTION 1.

TASK INVENTORY

One of the major characteristics of competency-based education (CBE) is that the course content is based upon actual jobs or tasks performed by the worker. In Virginia, the Department of Education has established standards for competency-based education. According to these standards, competencies must be role-relevant and based upon appropriate research. This standard states:

> Role-relevant competencies that include standards are identified and stated.
>
> The competencies with standards will be identified through V-TECS, IDECC, and other appropriate research. Advisory committees should be used to review competencies and standards. Competencies in the affective domain will be included. Role-relevant competencies for occupational preparation programs are those that specifically relate to the occupation for which the student is being prepared, as well as to the personal needs of the student. Role-relevant competencies are related also to orientation, exploration, and/or industrial arts experiences which have been identified for students.

Therefore, role-relevant jobs or tasks, called competencies in CBE, must be identified and validated before instructional materials are developed and subsequent instruction takes place. The task list in this document is based on the following:

1. The current V-TECS catalogs
2. Job titles and descriptions found in the Occupational Outlook Handbook and Dictionary of Occupational Titles
3. The review and selection of appropriate competency-based materials
4. Interviews with former students and incumbent workers in the masonry field
5. Input from teachers and curriculum specialists
6. Input from local occupational (craft) advisory committee members.

On the basis of the information collected and reviewed from the available sources indicated, a task inventory was prepared.

The next major step involved in the development of the task inventory was validation of the task list. Validation is essential if the information collected is to be useful in operating CBE courses and programs. The validation process involved the following:

1. Review of writing team members to determine completeness of the inventory
2. Review and validation by local craft advisory committee to ensure the role-relevance and completeness of the inventory
3. Review by selected incumbent workers in local and regional industry to determine the validity of the inventory
4. Final review and editing by writing team members, project directors, and state staff.

This process was used to determine if the identified tasks were performed by workers presently employed and if the task was critical for job entry level. It also was used to determine the time spent doing the specific task.

The task list included in this guide was based on current available resources and was validated by teachers, advisory committee members, and incumbent workers. It is essential that all instruction be based on the validated task analyses included in this publication.

The task analyses sheets have not been arranged in order of difficulty of tasks or instructional sequence. Sequencing has been shown in the sample sequence listing for each course, contained in Section 2 of this guide.

The task analyses sheets are arranged by duty area for the specific occupational domain covered by the guide. Information contained on each sheet is as follows:

1. The task/competency for a given duty area which is performed by incumbent workers
2. Program and course application information
3. Performance and enabling objectives for instructional materials development

4. Criterion-referenced measures or test items used to determine successful attainment of the task/competency by the student
5. Instructional activities and steps required for teaching the task/competency
6. Tools, equipment, and materials/supplies recommended as instructional aids
7. Reference and audiovisual materials helpful in teaching the task competency.

TASK INVENTORY
FOR

MASONRY

(46.0102)

DUTY AREAS

1. GETTING STARTED IN MASONRY
2. DEVELOPING BASIC MASONRY SKILLS
3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS
4. PREPARING FOUNDATIONS AND FOOTINGS
5. CONSTRUCTING BRICK STRUCTURES
6. CONSTRUCTING CHIMNEYS AND FIREPLACES
7. PERFORMING SUPERVISORY FUNCTIONS
8. GETTING AND KEEPING A JOB

DUTY AREA

1. GETTING STARTED IN MASONRY

TASKS/COMPETENCIES

1.1 Prepare for classroom instruction and activities

1.2 Identify job opportunities in the masonry field

1.3 Identify safety equipment and rules used in the masonry shop

1.4 Use shop tools and machines safely

1.5 Participate in in-class activities of VICA

SELECTED INSTRUCTIONAL ACTIVITIES

1. Distribute handouts of shop rules and school policies or student handbook. Discuss with class. Identify areas of the masonry shop and explain rules pertaining to each area (E1.1.1-E1.1.3).
2. Distribute textbook and/or workbooks and review with class. Discuss table of contents, organization of text, index, and other pertinent information (E1.1.4).
3. Provide students with copies of course outline and objectives and discuss (E1.1.5).
4. Have students complete personal data form as required by school and/or instructor policy (E1.1.2, E1.1.3).

SELECTED TOOLS AND MATERIALS

Textbooks and/or workbook
Handouts: School policy and/or student handbook
Course outline and objectives
Shop policy
Instructor guidelines

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

None identified

Application

DUTY AREA

1. GETTING STARTED IN MASONRY

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

1.1 Prepare for classroom instruction and activities

COURSE

Masonry I (8512)
Masonry II (8513)

1.1

PERFORMANCE OBJECTIVE

P1.1 Given copies of school and shop policies, textbook, course outline and objectives, and other related information, prepare for classroom instruction and activities by organizing and maintaining class information and handouts in a student notebook. Notebook must be maintained in accordance with instructor-provided guidelines.

SELECTED ENABLING OBJECTIVES

E1.1.1	State names of instructor and administrative personnel.
E1.1.2	List shop rules.
E1.1.3	Relate shop rules to school policy.
E1.1.4	Outline organization of textbooks and/or workbooks.
E1.1.5	State course objectives.

CRITERION-REFERENCED MEASURE

C1.1 Student notebook maintained in accordance with instructor-provided guidelines.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Demonstrate how to obtain information from references such as DOT, OOH, and Trade and Industrial Service Area Resource (E1.2.4).
2. Invite a resource person to speak to class about the apprenticeship program and employment opportunities in the masonry field (E1.2.1-E1.2.3).
3. Distribute worksheets and discuss information needed to complete the handout, such as employment outlook, salary structure, job duties, and benefits (E1.2.1-E1.2.5).

SELECTED TOOLS AND MATERIALS

Handout: Instructor-prepared worksheet

SELECTED AUDIOVISUAL MATERIALS

Film: Careers in the Building Trades (80812). Virginia Department of Education.

SELECTED REFERENCES

Dictionary of Occupational Titles. U. S. Department of Labor.
Masonry Worker, pp. 6-7. V-TECS.
Occupational Outlook Handbook. U. S. Department of Labor.
Student Material--Masonry--Competency Based Education. West Virginia Vocational Curriculum Laboratory.
Trade and Industrial Education Service Area Resource. Virginia Department of Education.
Virginia VIEW (computer software or microfiche). VPI & SU.

DUTY AREA

1. GETTING STARTED IN MASONRY

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

1.3 Identify safety equipment and rules used in the masonry shop

COURSE

Masonry I (8512)
Masonry II (8513)

1.3

PERFORMANCE OBJECTIVE

P1.3 Given a handout of safety rules and a demonstration of the operation of safety equipment, identify safety equipment and rules used in the masonry shop by scoring 100% on a written or performance test given by the instructor.

SELECTED ENABLING OBJECTIVES

E1.3.1 State safety rules and identify safety equipment.

E1.3.2 Identify specific unsafe or hazardous situations that may occur in the masonry shop.

E1.3.3 Relate safety equipment associated with the shop to its proper usage for a particular situation.

E1.3.4 State the location of fire extinguishers and fire alarms.

E1.3.5 Identify procedures for fire drills.

E1.3.6 List and state the function of personal safety equipment.

E1.3.7 Explain OSHA (Occupations Safety and Health Admininstration) standards.

CRITERION-REFERENCED MEASURE

C1.3 Safety equipment and rules identified with 100% accuracy on a written or performance test.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students identify general safety rules and equipment required for a safe working environment (E1.3.1-E1.3.6).
2. Provide students with a list of safety rules and discuss in detail (E1.3.1-E1.3.3).
3. Have students locate fire extinguishers and describe fire drill procedures in accordance with school policy (E1.3.4-E1.3.6).
4. Have students practice all safety procedures on a daily basis (E1.3.1-E1.3.3).
5. Review with students OSHA standards and relate to shop and job site situations (E1.3.7).

SELECTED TOOLS AND MATERIALS

Handout: Shop safety rules
Personal safety equipment
Shop safety equipment

SELECTED AUDIOVISUAL MATERIALS

Film:	Safety in the Shop--Basic Practices (37310). Virginia Department of Education.
Filmstrips:	Developing Shop Safety Skills. AAVIM. Practicing Safety, Safety at Work. Prentice-Hall Media.

SELECTED REFERENCES

The Bricklayer: Brick and Block Construction, Vol. II. Taylor and Harland.
Masonry Skills, pp. 298-305. Kreh.
Modern Masonry. Kicklighter.

Application

DUTY AREA

1. GETTING STARTED IN MASONRY

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

1.4 Use shop tools and machines safely

COURSE

Masonry I (8512)
Masonry II (8513)

1.4

PERFORMANCE OBJECTIVE

P1.4 Given shop equipment, instructor demonstration, and the proper safety instructions for each tool and machine, use shop tools and equipment safely in accordance with instructor demonstration. A score of 100% must be achieved on a performance test.

SELECTED ENABLING OBJECTIVES

E1.4.1 Identify safety precautions associated with each tool and machine in the masonry shop.

E1.4.2 Explain how to operate machines in a safe manner.

E1.4.3 Locate safety precautions as prescribed in operator's manuals.

E1.4.4 Demonstrate safe operation of equipment.

E1.4.5 Relate safety to proper care, maintenance, and storage of tools and equipment.

CRITERION-REFERENCED MEASURE

C1.4 Shop tools and machines used safely on a performance test with 100% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students read operator's manuals for equipment in the shop (E1.4.1-E1.4.4).
2. Give a demonstration of safe operation or use of tools and machines in the shop (E1.4.1-E1.4.4).
3. Have students complete a written safety test on the operation of specific equipment (E1.4.1-E1.4.4).
4. Discuss proper maintenance procedures for tools and equipment. Have students identify storage locations and procedures (E1.4.5).

SELECTED TOOLS AND MATERIALS

Operator's manuals
Personal safety equipment

SELECTED AUDIOVISUAL MATERIALS

Film: Safety in the Shop--Basic Practices (37310). Virginia Department of Education.

SELECTED REFERENCES

Masonry Skills, pp. 298-305. Kreh.
Masonry Worker, pp. 9-10. V-TECS.
Safety for Masons, Unit 6. Kreh.

—— Application ——

DUTY AREA

1. GETTING STARTED IN MASONRY

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

1.5 Participate in in-class activities of VICA

COURSE

Masonry I (8512)
Masonry II (8513)

1.5

PERFORMANCE OBJECTIVE

P1.5 Given student organization guidelines, participate in in-class activities of VICA, including regularly scheduled meetings, according to guidelines provided.

SELECTED ENABLING OBJECTIVES

E1.5.1 Identify advantages and responsibilities of VICA membership.

E1.5.2 Recite the VICA motto and pledge.

E1.5.3 Identify VICA colors and emblem symbols.

E1.5.4 Identify competitive events for masonry sponsored by VICA for local, state, and national contests.

E1.5.5 Identify VICA activities which benefit the community.

E1.5.6 Explain the VICA club structure.

CRITERION-REFERENCED MEASURE

C1.5 VICA meeting participated in, in accordance with VICA guidelines.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students read and discuss the VICA Leadership Handbook. Explain the role of each officer and how the local chapter is affiliated with state and national organizations (E1.5.6).
2. Show filmstrip, VICA: Going All the Way, and have students discuss the advantages and responsibilities of VICA membership (E1.5.1-E1.5.5).
3. Discuss how VICA membership relates to an individual's personal, educational, and career goals (E1.5.1).
4. Show slides or photographs of past local activities, including contests, and explain the reasons for competions (E1.5.4).
5. Have a past VICA member speak to the class about participation in activities and competitive events (E1.5.1, E1.5.4, E1.5.5).
6. Display and discuss the VICA club calendar of activities (E1.5.1, E1.5.5).
7. Have students plan a social event, school or community improvement project, or service activity during a regular VICA meeting (E1.5.1-E1.5.6).

SELECTED TOOLS AND MATERIALS

American flag
VICA banner
Gavel
Ceremonial emblem
VICA charter
VICA creed
VICA official scrapbook
Secretary's notebook
Treasurer's notebook

SELECTED AUDIOVISUAL MATERIALS

Filmstrip: VICA: Going All the Way. VICA State Advisor, Virginia Department of Education.

Slides or photographs of VICA activities

SELECTED REFERENCES

Robert's Rules of Order, Newly Revised. Henry M. Robert.
VICA Leadership Handbook. National VICA.
VICA U.S. Skill Olympics. National VICA.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

TASKS/COMPETENCIES

2.1 Apply basic mathematical concepts

2.2 Identify mason's tools

2.3 Read and interpret blueprints and specifications

2.4 Measure distance from reference points

2.5 Mark guidelines on working surface

2.6 Determine horizontal and vertical alignment

2.7 Identify sizes and kinds of brick

2.8 Identify sizes and kinds of block

2.9 Identify types of mortar

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

2.1 Apply basic mathematical concepts

COURSE

Masonry I (8512)
Masonry II (8513)

2.1

PERFORMANCE OBJECTIVE

P2.1 Given appropriate review, references, and practice, apply basic mathematical concepts to practical masonry problems by completing an instructor-prepared worksheet with 85% accuracy.

SELECTED ENABLING OBJECTIVES

E2.1.1 Use mason's rule to draw specified lengths.

E2.1.2 Add, subtract, multiply, and divide fractions.

E2.1.3 Relate use of percentages to masonry problems.

E2.1.4 Calculate number of brick or block for a specific task.

E2.1.5 Identify mathematical concepts on a simple blueprint.

CRITERION-REFERENCED MEASURE

C2.1 Basic mathematical concepts applied to masonry problems on instructor-prepared worksheet with 85% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students practice using a mason's rule (E2.1.1).
2. Review basic principles of math and have students practice solving problems (E2.1.2).
3. Provide students with sample masonry problems and have them solve (E2.1.1-E2.1.5).
4. Show appropriate filmstrip and discuss (E2.1.1-E2.1.4).

SELECTED TOOLS AND MATERIALS

Mason's rule
Handouts: Instructor-prepared worksheet
Sample problems

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes:
Reading a Mason's Rule, On-The-Job Measurements. Singer Career Systems.
Fractions and Decimals: On-The-Job Conversion, On-The-Job Measurements. Singer Career Systems.
Basic Measurement Math. Career Aids, Inc.

SELECTED REFERENCES

Practical Problems in Mathematics for Masons. Ball.
Student Material--Masonry--Competency Based Education. West Virginia Vocational Curriculum Laboratory.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

2.2 Identify mason's tools

COURSE

Masonry I (8512)
Masonry II (8513)

2.2

PERFORMANCE OBJECTIVE

P2.2 Given a trowel, brick hammer, brick set, plumb rule, rule, mason's line, blocking chisel, square, tile hammer, jointer, or other bricklayer's tools, identify each tool by name and describe its use on a written or oral quiz with 85% accuracy.

SELECTED ENABLING OBJECTIVES

E2.2.1 Identify standard bricklayer tools.

E2.2.2 Match a list of bricklayer's tools with corresponding descriptive statements.

E2.2.3 List outstanding features to look for when selecting and purchasing bricklayer tools.

E2.2.4 Explain proper care and maintenance of tools.

CRITERION-REFERENCED MEASURE

C2.2 Mason's tools identified on written or oral quiz with 85% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Distribute graphic illustrations of basic mason's tools and give a brief description of each. Have students maintain these as a fundamental resource in their student notebooks (E2.2.1-E2.2.3).
2. Display samples of mason's tools. Allow students to handle them, identify them, and discuss their uses (E2.2.1).
3. Discuss guidelines for selecting and purchasing bricklayer's tools (E2.2.3).
4. Demonstrate procedures for proper care, maintenance, and storage of mason's tools (E2.2.4).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Blocking chisel
Square
Tile hammer
Jointer

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes:	Mason's Tools and Measuring Devices, Basic Masonry Skills. Prentice-Hall Media. Masonry Tools, Masonry. Singer Career Systems. Basic Hand Tools. DCA Educational Products.
Transparencies:	Masonry Tools. DCA Educational Products.

SELECTED REFERENCES

Masonry Skills. Kreh.
Masonry Worker, pp. 29-30. V-TECS.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

2.3 Read and interpret blueprints and specifications

COURSE

Masonry I (8512)
Masonry II (8513)

2.3

PERFORMANCE OBJECTIVE

P2.3 Given a blueprint, masonry specifications, and an instructor-prepared worksheet, read and interpret the drawing by completing the worksheet with 85% accuracy.

SELECTED ENABLING OBJECTIVES

E2.3.1 Define masonry terms associated with blueprints.

E2.3.2 Identify lines and symbols used in architectural and drafting design.

E2.3.3 Interpret specifications.

E2.3.4 Prepare a simple blueprint.

CRITERION-REFERENCED MEASURE

C2.3 Blueprint and specifications read and interpreted with 85% accuracy on instructor-prepared worksheet.

SELECTED INSTRUCTIONAL ACTIVITIES

1. List and explain the lines, abbreviations, and symbols used in architectural and drafting design (E2.3.1, E2.3.2).
2. Have students examine several different blueprints and interpret the information shown (E2.3.3).
3. Arrange a visit to a drafting firm for students to observe the preparation of a blueprint (E2.3.3).
4. Have students prepare a simple blueprint, using basic symbols, abbreviations, and lines (E2.3.4).

SELECTED TOOLS AND MATERIALS

Rule
Blueprint copy
Specifications
Instructor-prepared worksheet

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes:	Blueprint Measurement Terminology, On-The-Job Measurements. Singer Career Systems. Introduction and Overview, Blueprint Reading Skills. Prentice-Hall Media.

SELECTED REFERENCES

Plan Reading for Brickmasons. Brick Institute of America.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

2.4 Measure distance from reference points

COURSE

Masonry I (8512)

2.4

PERFORMANCE OBJECTIVE

P2.4 Given rules, steel tape, a level transit, and a point of reference, measure the distance from bench mark to finish floor and record measurements. Measurements must be taken from three points and each measurement must be within ⅛" of the exact distance.

SELECTED ENABLING OBJECTIVES

E2.4.1 Define: bench mark, finish floor, and other masonry terms associated with measuring from reference points.

E2.4.2 Explain how bench marks are established.

E2.4.3 Identify tools needed to measure distance.

E2.4.4 Explain need for setting up reference points.

E2.4.5 Read a rule to at least a ⅛".

E2.4.6 Demonstrate how to set up a level transit.

CRITERION-REFERENCED MEASURE

C2.4 Distance measured from bench mark to finish floor to within ⅛" of exact distance.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students define and discuss terms associated with measurement from distance points. Explain briefly how surveying engineers establish bench marks (E2.4.1, E2.4.2).
2. Demonstrate procedure used for measuring reference point distances (E2.4.2-E2.4.4).
3. Review the reading of a rule (E2.4.5).
4. Observe and advise students as they practice the steps in setting up the level transit (E2.4.6).

SELECTED TOOLS AND MATERIALS

Plumb rule
Rule
100' steel tape
Level transit
Target stake

SELECTED AUDIOVISUAL MATERIALS

Films: Basic Bricklaying (MH-1659). Structural Clay Products Institute.
Elements of Brickwork (09710). Virginia Department of Education.

SELECTED REFERENCES

Bricklaying Vocational Training, 3rd ed. Roark and Plummer.

Application

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

2.5 Mark guidelines on working surface

COURSE

Masonry I (8512)

2.5

PERFORMANCE OBJECTIVE

P2.5 Given rules, a level transit, marking keel, plumb bobs, and other necessary tools, equipment, and supplies, mark guidelines on a working surface. The bench mark must be established at approximately 12' running intervals and exactly 48" in height from finish floor. The lines representing the bench mark must all be level to each other and measured with 100% accuracy.

SELECTED ENABLING OBJECTIVES

E2.5.1 Define masonry terms related to marking guidelines.

E2.5.2 Identify trade terms for marked guidelines in construction.

E2.5.3 List the tools and equipment necessary to mark guidelines.

E2.5.4 Outline the procedures to follow when marking guidelines on working surface.

CRITERION-REFERENCED MEASURE

C2.5 Guidelines marked, all level to each other, and measured with 100% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students define terms related to marking guidelines (E2.5.1., E2.5.2).
2. Arrange a display of various masonry tools and have students select and identify those tools needed to mark guidelines (E2.5.3).
3. Have students observe demonstration on marking guidelines on a working surface (E2.5.4).
4. Have students practice marking guidelines (E2.5.4).

SELECTED TOOLS AND MATERIALS

Plumb rule
Plumb bobs
Rule
Level transit
Marking keel
Target stake

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes: Masonry Tools, Masonry, Singer Career Systems.
Hand Tools and Mortar (Unit I), Masonry. Career Aids, Inc.

SELECTED REFERENCES

Bricklaying Vocational Training Student's Textbook, Roark and Plummer.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

2.6 Determine horizontal and vertical alignment

COURSE

Masonry I (8512)

2.6

PERFORMANCE OBJECTIVE

P2.6 Given masonry and zoning commission specifications, a building site, and the necessary tools and equipment, determine the vertical and horizontal alignment of the building line and grade lines. The front vertical building line and the horizontal grade lines must be located to within 3" of the stated building and zoning commission specifications.

SELECTED ENABLING OBJECTIVES

E2.5.1 Define: vertical, horizontal, alignment, and grade line.

E2.5.2 Explain how building lines are established.

E2.5.3 Identify methods used to determine grading heights.

E2.5.4 Identify and explain the major functions of the level transit.

E2.5.5 Demonstrate how to use level transit, plumb bob, and target stake.

CRITERION-REFERENCED MEASURE

C2.6 Horizontal and vertical alignment established to within 3" of masonry and zoning commission specifications.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss vertical and horizontal alignment. Give students an opportunity to answer questions to validate their understanding of alignment concepts (E2.6.1).
2. Invite a local offical to speak to class regarding zoing commission responsibilities and their implications for brick masons (E2.6.1-E2.6.5).
3. Have students practice determining vertical and horizontal alignment on various building sites (E2.6.5).

SELECTED TOOLS AND MATERIALS

Plumb rule
Rule
Level transit
Target stake
Specifications
Marking keel

SELECTED AUDIOVISUAL MATERIALS

Films: Basic Bricklaying (MH-1659). Structural Clay Products Institute.
Elements of Brickwork (09710). Virginia Department of Education.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma Department of Vocational and Technical Education.
Masonry Skills. Kreh.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

2.7 Identify sizes and kinds of brick

COURSE

Masonry I (8512)

2.7

PERFORMANCE OBJECTIVE

P2.7 Given classroom instruction and an assortment of sizes and kinds of brick, identify each brick with 100% accuracy on a written or oral quiz.

SELECTED ENABLING OBJECTIVES

E2.7.1 Distinguish among face brick, common brick, and fire brick.

E2.7.2 Explain the differences in Standard, Norman, and Roman brick.

E2.7.3 State the advantages of using oversized brick.

E2.7.4 List uses of specific kinds and sizes of brick.

CRITERION-REFERENCED MEASURE

C2.7 Sizes and kinds of brick identified on an oral or written quiz with 100% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Provide examples of each kind of brick, and explain purpose and uses (E2.7.1, E2.7.2, E2.7.4).
2. Explain the main benefits of oversized brick (E2.7.3).
3. Arrange for students to visit a brick manufacturing company (E2.7.1-E2.7.4).
4. Provide illustrations--slides, drawings, pictures, or transparencies--of various sizes and kinds of brick as they are used in construction (E2.7.1-E2.7.4).

SELECTED TOOLS AND MATERIALS

Face, fire, solite, and other brick

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Concrete and Masonry: Techniques and Design, DeCristoforo.
Masonry Skills. Kreh.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

2.8 Identify sizes and kinds of block

COURSE

Masonry I (8512)

2.8

PERFORMANCE OBJECTIVE

P2.8 Given classroom instruction and an assortment of sizes and kinds of block, identify each block with 100% accuracy on an oral or written quiz.

SELECTED ENABLING OBJECTIVES

E2.8.1 Explain the differences in solid, semi-solid, pier, and flue block.

E2.8.2 List various uses of 2-, 6-, and 12-inch block.

E2.8.3 Relate building code specifications to block size.

E2.8.4 Explain use of ornamental block.

CRITERION-REFERENCED MEASURE

C2.8 Sizes and kinds of block identified on an oral or written quiz with 100% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Provide students with samples of sizes and kinds of block and discuss uses (E2.8.1-E2.8.4).
2. Discuss local building code regulations for block sizes for specific situations (E2.8.3).
3. Provide illustrations or arrange for students to visit in the community to identify kinds of block and their uses (E2.8.1, E2.8.4).

SELECTED TOOLS AND MATERIALS

Solid, pier, and other block

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Concrete Masonry Vocational Training: Student Manual. Toennies and Merten.
Masonry Skills. Kreh.
Masonry Worker, p. 20. V-TECS.

DUTY AREA

2. DEVELOPING BASIC MASONRY SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

2.9 Identify types of mortar

COURSE

Masonry I (8512)

2.9

PERFORMANCE OBJECTIVE

P2.9 Given background information and classroom discussion, identify M, S, N, and O types of mortar on an instructor-prepared quiz with 85% accuracy.

SELECTED ENABLING OBJECTIVES

E2.9.1 List the components of mortar.

E2.9.2 Explain the purpose and function of the ASTM.

E2.9.3 Determine the differences in the ratio of components in different types mortar.

E2.9.4 Explain the effects of using mortar that is not mixed according to specifications.

CRITERION-REFERENCED MEASURE

C2.9 Mortar types identified on instructor-prepared quiz with 85% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Describe the components of mortar, and discuss how mortar is mixed (E2.9.1, E2.9.3).
2. Describe the work of the American Society for Testing Materials and its importance (E2.9.2).
3. Explain appropriate uses for the different types of mortar (E2.9.1-E2.9.4).
4. Illustrate or describe the effects of using mortar that does not conform to specifications (E2.9.4).

SELECTED TOOLS AND MATERIALS

ASTM code
Handout: Instructor-prepared quiz

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Bricks, Blocks, and Mortar, Basic Masonry Skills, Prentice-Hall Media.

SELECTED REFERENCES

Bricklaying Vocational Training. Roark and Plummer.
Concrete Masonry Vocational Training: Student Manual. Toennies and Merlen,
Masonry Skills. Kreh.
Masonry Worker, pp. 22-23. V-TECS.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASKS/COMPETENCIES

3.1 Set up work station

3.2 Proportion and mix mortar by hand

3.3 Mix lime mortar with power mixer.

3.4 Use a trowel

3.5 Lay brick in common bond pattern

3.6 Lay a header course (full)

3.7 Lay a rowlock course

3.8 Lay a soldier course

3.9 Lay a sailor course

3.10 Lay a shiner course

3.11 Build a wall in stack bond pattern

3.12 Build a wall in Flemish bond pattern

3.13 Tool concave joints

3.14 Build corners (outside/inside)

3.15 Tool rake joints

3.16 Tool V-joints

3.17 Point a wall

3.18 Cut a bat closure

3.19 Clean brick walls

3.20 Lay running bond pattern in concrete masonry

3.21 Lay vertical bond pattern in concrete masonry

3.22 Gauge masonry wall with story pole

3.23 Lay specialized patterns

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASK / COMPETENCY

3.1 Set up work station

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)

3.1

PERFORMANCE OBJECTIVE

P3.1 Given materials and tools to be used on a particular building project, set up a work station. The mortar pan and other tools and materials should be set up so that there is a work path between the project and the work station of 2 to 3 feet. All tools and materials should be easily accessible to a bricklayer and should not obstruct the work path.

SELECTED ENABLING OBJECTIVES

E3.1.1 Identify mason tools and basic materials needed for bricklaying.

E3.1.2 Name tools that are needed for specific kinds of brick work.

E3.1.3 Cite the distance that materials should be located from project.

CRITERION-REFERENCED MEASURE

C3.1 Work station set up with a path of 2 to 3 feet between project and work station; all tools and materials are easily accessible to bricklayer and do not obstruct work path.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Review tools and materials and discuss their placement in the work station (E3.1.1)
2. Demonstrate procedure for setting up work station (E3.1.1, E3.1.2).
3. Have two or three work stations set up with intentional errors. Have students point out discrepancies in the set up (E3.1.3).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Blocking chisel
Square
Jointer
Brick
Mortar
Mortar stand
Mortar board

SELECTED AUDIOVISUAL MATERIALS

Films: Basic Bricklaying (MH-1659). Structural Clay Products Institute.
Elements of Brickwork (09710). Virginia Department of Education.

SELECTED REFERENCES

Bricklaying Vocational Training. Roark and Plummer.
Masonry Skills. Kreh.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.2 Proportion and mix mortar by hand

COURSE

Masonry I (8512)

3.2

PERFORMANCE OBJECTIVE

P3.2 Given necessary equipment, materials, and mix specifications, proportion and mix mortar by hand. Mixed mortar must have uniform color and must slide gradually from the trowel.

SELECTED ENABLING OBJECTIVES

E3.2.1 List steps to be followed in mixing mortar by hand.

E3.2.2 Explain the advantages of dry-mixing the mortar as a preliminary step.

E3.2.3 List equipment and materials needed to perform task.

CRITERION-REFERENCED MEASURE

C3.2 Mortar proportioned and mixed by hand according to mix specifications; mixed mortar is of uniform color and slides gradually from the trowel.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Review proportions and discuss common proportions of sand, water, etc., to mix with various mortars (E3.2.1-E3.2.3).
2. Review study of the types of mortar (E3.2.2).
3. Demonstrate the procedure for mixing mortar by hand (E3.2.1, E3.2.3).
4. Have students compare dry-mixing with "sandwiching" mortar between sand. Discuss the difference (E3.2.2).

SELECTED TOOLS AND MATERIALS

Trowel
Mortar hoe
Square point shovel
Mortar box
Water
Pail
Sand
Lime
Cement
Mix specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes: Hand Tools and Mortar (Unit I), Masonry. Career Aids, Inc.
Mixing Mortar by Hand. DCA Educational Products.

SELECTED REFERENCES

Concrete Masonry Vocational Training. Toennies and Merten.
Masonry Skills, pp. 78-80. Kreh.

—— Application ——

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.3 Mix lime mortar with power mixer

COURSE

Masonry I (8512)
Masonry II (8513)

3.3

PERFORMANCE OBJECTIVE

P3.3 Given necessary equipment, supplies, and mix specifications, mix lime mortar in power mixer. Mixed mortar must have uniform color throughout and must slide gradually from the trowel. All safety precautions must be observed.

SELECTED ENABLING OBJECTIVES

E3.3.1 Identify components and controls of power mixer.

E3.3.2 List materials, equipment, and supplies needed to mix lime mortar in power mixer.

E3.3.3 Outline ways to determine ratio and proportion of sand and lime.

E3.3.4 List and demonstrate steps for mixing lime mortar in power mixture. Include: a) pour water into power mixer while mixer is in operation, b) add masonry sand to the water, c) empty lime into sand and water in power mixer, d) mix contents until lime and sand become one color, and e) pour mixed mortar from power mixer into mortar box.

E3.3.5 List and demonstrate safety precautions needed to operate power mixer.

CRITERION-REFERENCED MEASURE

C3.3 Mortar mixed with power mixer in accordance with mix specifications; mixed mortar has uniform color and slides gradually from trowel. All safety precautions are observed.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Identify components of a power mixer and demonstrate how to operate controls (E3.3.1).
2. Display materials, equipment, and supplies needed to mix lime mortar in power mixer (E3.3.2).
3. Discuss factors that determine ratio and proportion of sand and lime (E3.3.3).
4. Demonstrate procedure for mixing lime mortar in power mixer (E3.3.4).
5. Require students to pass safety test on operation of power mixer (E3.3.5).

SELECTED TOOLS AND MATERIALS

Square point shovel
Mortar box
Sand
Lime
Cement
Bucket
Water
Safety hat
Mix specifications
Power mixer

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Kentucky CBVE Instructional Materials, MY-1#5-50. Division of Materials and Curriculum.
Masonry, Performance Objective 41. V-TECS.
Masonry Skills, pp. 80-83. Kreh.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.4 Use a trowel

COURSE

Masonry I (8512)

3.4

PERFORMANCE OBJECTIVE

P3.4 Given mortar, mortar board, trowel, and other necessary equipment and supplies, use a trowel to cut, spread (string), and furrow enough mortar to lay 3 bricks on a 2 x 4 piece of lumber. The trowel must be held and used correctly, and there should be only a minimal amount of spillage at the work site.

SELECTED ENABLING OBJECTIVES

E3.4.1 Define cut, spread (string), furrow, and butter.

E3.4.2 Demonstrate the correct way to hold the trowel.

E3.4.3 Demonstrate methods to pick up mortar with the trowel.

E3.4.4 Explain how to hold the trowel to spread and furrow mortar.

CRITERION-REFERENCED MEASURE

C3.4 Trowel is used correctly to cut, spread, and furrow the proper amount of mortar to lay 3 bricks with a minimal amount of spillage.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Spell, pronounce, and define terminology related to working with the trowel and mortar (E3.4.1).
2. Arrange for a field trip to a construction site. Have students observe mortar being mixed, and techniques used by the masons (E3.4.1-E3.4.4).
3. Provide students with trowels of different sizes and explain the use of each (E3.4.4).
4. Demonstrate how to hold the trowel and the methods to lift mortar, such as cupping (E3.4.2, E3.4.3).
5. Have students first practice cutting, spreading, and furrowing mortar on mortar boards (E3.4.2-E3.4.4).

SELECTED TOOLS AND MATERIALS

Mortar
Mortar boards
Trowels
Bricks
2 x 4 lumber
Blocks
Level

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes:	Hand Tools and Mortar (Unit I), Masonry. Career Aids, Inc, Installing Brick, Masonry. Singer Career Systems. Spreading Mortar. DCA Educational Products. Using the Mason's Trowel, Basic Masonry Skills. Prentice-Hall Media.

SELECTED REFERENCES

Masonry Skills, pp. 42-46. Kreh.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASK/COMPETENCY

3.5 Lay brick in common bond pattern

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)
Masonry II (8513)

3.5

PERFORMANCE OBJECTIVE

P3.5 Given necessary equipment, tools, supplies, and building specifications, lay a common bond wall with full headers. Wall must be laid on modular scale, 6 or 4 courses to 11 inches with full headers every 6th course. Wall must be level, plumb, straight-edged, and joints pointed, tooled, and brushed.

SELECTED ENABLING OBJECTIVES

E3.5.1 Define: dry bond, course, veneer, level, square, full header, bed, plumb, jamb, face side, straight-edge, ranged, jointed, pointed, and bond patterns.
E3.5.2 Assemble equipment, tools, and supplies needed to lay a common bond pattern.
E3.5.3 Lay out work, using building specifications.
E3.5.4 List and demonstrate steps for laying common bond pattern:
  a. Lay the bond out dry.
  b. Lay first course brick in mortar with veneer bond and on 6, using brick spacing rule.
  c. Level and square the first course.
  d. Cut four 6-inch pieces.
  e. Bed 6-inch piece on each corner on 6.
  f. Lay full headers between 6-inch pieces.
  g. Level and plumb course.
  h. Lay 5 courses of the veneer bond.
  i. Repeat steps d - h.
E3.5.5 Explain why all work must be ranged, jointed, and pointed.

CRITERION-REFERENCED MEASURE

C3.5 Common bond wall laid on modular scale, 6 or 4 courses to 11 inches with full headers every 6th course; wall is level, plumb, straight-edged, and joints pointed, tooled, and brushed.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students select a common bond pattern when given an illustration of several different bond patterns (E3.5.1).
2. Have students identify and assemble all necessary equipment, tools, and supplies (E3.5.2).
3. Demonstrate procedure for laying out a common bond pattern (E3.5.3-E3.5.5).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Gauge stick
Specifications
Jointer
Brick
Mortar
Set of line blocks
Mortar stand
Mortar board
Mason's brush

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	Installing Brick, Masonry. Singer Career Systems.
Slides/Cassette:	Here's How: Basic Bricklaying. Kenalex Corporation.

SELECTED REFERENCES

Kentucky CBVE Instructional Materials, MY-4. Division of Materials and Curriculum.
Masonry, Performance Objective 21. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.6 Lay a header course (full)

COURSE

Masonry I (8512)
Masonry II (8513)

3.6

PERFORMANCE OBJECTIVE

P3.6 Given the necessary equipment, tools, supplies, and building specifications, lay a header course. Header course must begin with three-quarter brick and course must be level, straight-edged, pointed, and jointed.

SELECTED ENABLING OBJECTIVES

E3.6.1 Assemble materials, equipment, and supplies needed to lay a full header course.

E3.6.2 List common uses of full header course in brick construction.

E3.6.3 Lay out work, using building specifications.

E3.6.4 Demonstrate steps for laying a full header course:
a. Cut two 6-inch pieces.
b. Dry bond full header course to given dimensions.
c. Square and mark each corner.
d. Remove all bricks.
e. Set two 6-inch pieces on desired course.
f. Lay full header course flat across the wall.

CRITERION-REFERENCED MEASURE

C3.6 Header course laid beginning with three-quarter brick; course is level, straight-edged, pointed, and jointed.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Review study of mason's tools and relate to task (E3.6.1, E3.6.4).
2. Discuss problems associated with brick dimensions (E3.6.2-E3.6.4).
3. Explain purposes of header course and its uses in construction (E3.6.2).
4. Demonstrate procedure for laying a header course (E3.6.1-E3.6.4).
5. Show slides and have students discuss procedures for laying a header course (E3.6.1-E3.6.4).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Jointer
Brick
Mortar
Mortar stand
Mortar board
Set of line blocks
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Installing Brick, Masonry. Singer Career Systems.
Slides: Bricklayer Training Series. Career Aids, Inc.
Slides/Cassettes: Here's How: Laying of Headers, Rowlocks, and Soldiers. Kenalex Corporation.

SELECTED REFERENCES

Masonry, Performance Objective 29. V-TECS.
Masonry Worker, p. 51. V-TECS.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.7 Lay a rowlock course

COURSE

Masonry I (8512)

3.7

PERFORMANCE OBJECTIVE

P3.7 Given the necessary tools, equipment, and specifications, lay a rowlock course. The course must be straight and level with no holes or cracks, and the joints must be smooth and waterproof.

SELECTED ENABLING OBJECTIVES

E3.7.1 Distinguish among rowlock, sailor, shiner, and soldier courses.

E3.7.2 Assemble tools, equipment, and supplies needed to lay a rowlock course.

E3.7.3 Lay out work, using building specifications.

E3.7.4 Scale course to determine number of bricks required.

E3.7.5 Apply mortar to edges of brick to be laid.

E3.7.6 Place brick on edge with 2¼" x 4" end facing out.

E3.7.7 Butter and lay a closure.

E3.7.8 Point and joint course.

CRITERION-REFERENCED MEASURE

C3.7 Rowlock course laid correctly; course is straight and level with no holes or cracks, and joints are smooth and waterproof.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Display samples or illustrations of different type courses and have students distinguish among rowlock, sailor, and soldier courses (E3.7.1).

2. Have students identify examples of rowlock courses used in community construction and discuss purposes (E3.7.1).

3. Demonstrate procedure for laying rowlock course (E3.7.2-E3.7.8).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Jointer
Brick
Mortar
Mortar stand
Mortar board
Set of line blocks
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	Installing Brick, Masonry. Singer Career Systems.
Slides/Cassette:	Here's How: Laying of Headers, Rowlocks, and Soldiers. Kenalex Corporation.

SELECTED REFERENCES

Masonry, Performance Objective 29. V-TECS.
Masonry Worker, pp. 53-54. V-TECS.

Application

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.8 Lay a soldier course

COURSE

Masonry I (8512)

3.8

PERFORMANCE OBJECTIVE

P3.8 Given the necessary tools, equipment, and specifications, lay a soldier course. The course must be straight and level with no holes or cracks, and the joints must be smooth and waterproof.

SELECTED ENABLING OBJECTIVES

E3.8.1 Distinguish among rowlock, sailor, shiner, and soldier courses.

E3.8.2 Assemble tools, equipment, and supplies needed to lay soldier course.

E3.8.3 Lay out work, using building specifications.

E3.8.4 Scale course to determine number of bricks required.

E3.8.5 Butter and lay a closure.

E3.8.6 List and demonstrate steps for laying a soldier course.

CRITERION-REFERENCED MEASURE

C3.8 Soldier course laid correctly; course is straight and level with no holes or cracks, and joints are smooth and waterproof.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students identify and describe a soldier course (E3.8.1).
2. Demonstrate procedure for laying a soldier course (E3.82. - E3.8.6).
3. Have students demonstrate the buttering and laying of the closures (E3.8.5).
4. Emphasize the importance of proper spacing (E3.8.6).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Jointer
Brick
Mortar
Mortar stand
Mortar board
Set of line blocks
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.
Slides/Cassettes: Here's How: Laying of Headers, Rowlocks, and Soldiers. Kenalex Corporation.

SELECTED REFERENCES

Bricklaying Vocational Training. Roark and Plummer.
Masonry Skills. Kreh.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.9 Lay a sailor course

COURSE

Masonry I (8512)

3.9

PERFORMANCE OBJECTIVE

P3.9 Given the necessary tools, equipment, and specifications, lay a sailor course. The course must be straight and level with no holes or cracks, and the joints must be smooth and waterproof. All bricks must be laid on end with 4" x 8" side facing out.

SELECTED ENABLING OBJECTIVES

E3.9.1 Distinguish among rowlock, sailor, shiner, and soldier courses.

E3.9.2 Assemble tools, equipment, and supplies needed to lay sailor course.

E3.9.3 Lay out work, using building specifications.

E3.9.4 Scale course to determine number of bricks required.

E3.9.5 List and demonstrate steps for laying a sailor course.

CRITERION-REFERENCED MEASURE

C3.9 Sailor course laid correctly with 4" x 8" side facing out; course is straight and level with no holes or cracks, and joints are smooth and waterproof.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students identify and describe a sailor course (E3.9.1).
2. Demonstrate procedure for laying a sailor course (E3.9.2-E2.9.5).
3. Emphasize the importance of proper spacing (E3.9.5).
4. Demonstrate the buttering and laying of the closure (E3.9.5).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Jointer
Brick
Mortar
Mortar stand
Mortar board
Set of line blocks
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Masonry Skills. Kreh.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASK / COMPETENCY

3.10 Lay a shiner course

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)

3.10

PERFORMANCE OBJECTIVE

P3.10 Given the necessary tools, equipment, and specifications, lay a shiner course. The course must be straight and level with no holes or cracks, and the joints must be smooth and waterproof. All bricks must be laid on edge with 4" x 8" side facing out.

SELECTED ENABLING OBJECTIVES

E3.10.1 Distinguish among rowlock, sailor, shiner, and soldier courses.

E3.10.2 Assemble tools, equipment, and supplies needed to lay shiner course.

E3.10.3 Lay out work, using building specifications.

E3.10.4 Scale course to determine number of bricks required.

E3.10.5 Apply mortar.

E3.10.6 Position brick.

E3.10.7 Point and joint.

E3.10.8 Complete pattern.

CRITERION-REFERENCED MEASURE

C3.10 Shiner course laid correctly with 4" x 8" side facing out; course is straight and level with no holes or cracks, and joints are smooth and waterproof.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students identify and describe a shiner course (E3.10.1).
2. Demonstrate procedure for laying a shiner course (E3.10.2 - E3.10.8).
3. Emphasize importance of proper spacing (E3.10.6).
4. Demonstrate the buttering and laying of the closure (E3.10.7).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Jointer
Brick
Mortar
Mason's brush
Mortar stand
Mortar board
Set of line blocks
Specifications

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Masonry Skills. Kreh.

— Application —

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASK / COMPETENCY

3.11 Build a wall in stack bond pattern

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)
Masonry II (8513)

3.11

PERFORMANCE OBJECTIVE

P3.11 Given the necessary supplies, equipment, and specifications, build a wall in a stack bond pattern. The wall must be plumb, straight, and level with no holes or cracks. The vertical joint must be aligned with no overlapping of units and must be smooth and waterproof. Brick must be laid with 4" x 8" side down.

SELECTED ENABLING OBJECTIVES

E3.11.1	Identify and describe stack bond pattern.
E3.11.2	Assemble tools, equipment, and supplies needed to lay a stack bond pattern.
E3.11.3	Lay out work, using building specifications.
E3.11.4	Scale work for stack bond pattern.
E3.11.5	Apply mortar.
E3.11.6	Position brick.
E3.11.7	Point and joint.
E3.11.8	Complete pattern.
E3.11.9	Install steel reinforcement.

CRITERION-REFERENCED MEASURE

C3.11 Wall, built in stack bond pattern, is plumb, straight, and level with no holes or cracks. Vertical joint is aligned with no overlapping of units and is smooth and waterproof.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Explain the purposes of a stack bond pattern (E3.11.1).
2. Explain the frequency and importance of the uses of rigid steel reinforcement (E3.11.9).
3. Demonstrate procedure for laying a stack bond pattern (E3.11.1-E3.11.9).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Jointer
Brick
Mortar
Mortar stand
Mortar board
Mason's brush
Set of line blocks
Steel reinforcement/Dura-Wall
Specifications

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Masonry, Performance Objective 32. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.12 Build a wall in Flemish bond pattern

COURSE

Masonry I (8512)
Masonry II (8513)

3.12

PERFORMANCE OBJECTIVE

P3.12 Given necessary equipment, tools, supplies, and building specifications, lay an 8" Flemish bond pattern with alternating headers and stretchers, using Dutch corners. Wall must be level, plumb, straight-edged, ranged, and tooled according to specifications.

SELECTED ENABLING OBJECTIVES

E3.12.1 Define: dry bond, full header, stretcher, bed, level, plumb, straight-edge, range, tool work, Dutch corner, Flemish bond, and common bond.

E3.12.2 Assemble materials and tools needed to lay a Flemish bond pattern.

E3.12.3 Describe position of bricks in a Flemish bond pattern.

E3.12.4 Outline procedures for laying a Flemish bond pattern:
a. Square and mark desired position for pattern.
b. Lay dry bond a full header across the wall on each corner.
c. Lay stretcher next to header within desired pattern position.
d. Alternate full headers and stretchers to opposite end.
e. Fill in stretchers on opposite side of wall.
f. Bed up first course in mortar.
g. Level, straight-edge, and check for squareness.
h. Cut four 6-inch pieces.
i. Lay 6-inch pieces in mortar on each corner.
j. Lay full header next to six inch piece.
k. Lay stretcher next to header and alternate to opposite end.
l. Level, plumb, straight-edge, range, and tool work.
m. Repeat steps c through e to desired dimensions.

CRITERION-REFERENCED MEASURE

C3.12 Flemish bond wall built using Dutch corners; wall is level, plumb, straight-edged, ranged, and tooled according to specifications.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Provide students with a list of vocabulary words and their definitions. Where possible, illustrate the vocabulary word (E3.12.1).

2. Display illustrations of several bond patterns and have students identify the Flemish bond pattern (E3.12.1).

3. Demonstrate procedure for laying out a Flemish bond pattern and have students practice the procedure (E3.12.2-E3.12.4).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Gauge stick
Jointer

Brick
Mortar
Mortar stand
Mortar board
Set of line blocks
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes:	Installing Brick, Masonry. Singer Career Systems. Structural Pattern Bond, Basic Masonry Skills. Prentice-Hall Media.

SELECTED REFERENCES

Masonry, Performance Objective 28. V-TECS.
Masonry Skills, pp. 96-97. Kreh.

— Application —

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.13 Tool concave joints

COURSE

Masonry I (8512)
Masonry II (8513)

3.13

PERFORMANCE OBJECTIVE

P3.13 Given a constructed brick project, tools, supplies, and specifications, tool concave joints. All joints must be uniformly concave and smooth with no double imprints.

SELECTED ENABLING OBJECTIVES

E3.13.1 Define: concave jointer, head joints, bed joints, and sled runner.

E3.13.2 Assemble tools, equipment, and materials required to tool concave joints.

E3.13.3 Test mortar.

E3.13.4 Strike head joints with head jointer.

E3.13.5 Strike bed joints with bed runner.

E3.13.6 Fill and finish cracks or holes.

E3.13.7 Brush, rejoint, and clean all joints.

CRITERION-REFERENCED MEASURE

C3.13 Concave joints tooled and joints are uniformly concave and smooth with no double imprints.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students define terms associated with tooling joints (E3.13.1).
2. Demonstrate the use of concave jointing tools (E3.13.2).
3. Demonstrate how to tool concave joints (E3.13.2-E3.13.7).

SELECTED TOOLS AND MATERIALS

Trowel
Jointer (concave)
Mortar
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Film:	Basic Bricklaying (MH-1659). Structural Clay Products Institute.
Filmstrip/Cassette:	Installing Brick, Masonry. Singer Career Systems.

SELECTED REFERENCES

Masonry, Performance Objective 35. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASK / COMPETENCY

3.14 Build corners (outside/inside)

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)
Masonry II (8513)

3.14

PERFORMANCE OBJECTIVE

P3.14 Given necessary equipment, tools, supplies, and specifications, build a corner. The corner must be square, level, plumb, and straight-edged, and all courses must be laid on the same building specifications scale.

SELECTED ENABLING OBJECTIVES

E3.14.1 Lay out work, using building specifications.

E3.14.2 List and demonstrate steps for laying a corner. Include: a) layout of 90° angle, b) dry bonding, c) bedding corner brick, d) leveling and plumbing corner brick, e) laying brick, f) laying bricks 2-5, g) completing side, h) resquaring, if needed, i) establishing bond pattern on both sides, and j) completing required courses to reach desired height.

CRITERION-REFERENCED MEASURE

C3.14 Corner built according to specifications and is square, level, plumb, and straight-edged.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Demonstrate procedure for laying out and building of inside and outside corners (E3.14.1, E3.14.2).
2. Have students list the step-by-step procedure for laying corners (E3.14.2).
3. Have students practice building outside and inside corners (E3.14.1, E3.14.2).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Gauge stick
Square
Jointer
Brick
Mortar
Mortar stand
Mortar board
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Brick--Part B (Unit III), Masonry. Career Aids, Inc.

SELECTED REFERENCES

Masonry, Performance Objective 37. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.15 Tool rake joints

COURSE

Masonry I (8512)

3.15

PERFORMANCE OBJECTIVE

P3.15 Given a constructed brick project, tools, supplies, and specifications, tool rake joints. All joints must be uniformly raked, smooth, clean, free of holes, and to the depth stated in the specifications.

SELECTED ENABLING OBJECTIVES

E3.15.1 Define: rake jointer, head joint, and bed joint.

E3.15.2 List tools, equipment, and supplies required to tool rake joints.

E3.15.3 Adjust rake jointer to specified depth.

E3.15.4 Test mortar to be sure it is hard enough not to smear.

E3.15.5 Strike head joints from the bottom of the wall up with rake jointer.

E3.15.6 Strike bed joints from bottom of the wall up with rake jointer.

E3.15.7 Brush, rejoint, and clean all joints.

CRITERION-REFERENCED MEASURE

C3.15 Rake joints tooled to depth stated in specifications; all joints uniformly raked, smooth, clean, and free of holes.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students define key terms associated with rake joints (E3.15.1).
2. Demonstrate use of rake jointer (E3.15.2).
3. Explain and demonstrate step-by-step procedure for tooling rake joints. (E3.15.2-E3.15.7).

SELECTED TOOLS AND MATERIALS

Trowel
Rake jointer
Mortar
Tuck pointer/slicker
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	Installing Brick, Masonry. Singer Career Systems.

SELECTED REFERENCES

Kentucky CBVE Instructional Materials, MY-5. Division of Materials and Curriculum.
Masonry, Performance Objective 38. V-TECS.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASK / COMPETENCY

3.16 Tool V-joints

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)

3.16

PERFORMANCE OBJECTIVE

P3.16 Given a constructed brick project, tools, and supplies, tool V-joints. All joints must be uniformly V-tooled and smooth with no double imprints.

SELECTED ENABLING OBJECTIVES

E3.16.1 Define or identify: short V-jointer, long V-jointer, head joints, and bed joints.

E3.16.2 Select V-jointer to be used.

E3.16.3 Test mortar to see if ready to be jointed.

E3.16.4 Strike head joints from bottom of the wall up with short V-jointer.

E3.16.5 Strike bed joints from bottom of the wall up with long V-jointer by pushing along the wall with curved portion up front.

E3.16.6 Fill and finish joints which have cracks or holes.

E3.16.7 Remove excess mortar.

CRITERION-REFERENCED MEASURE

C3.16 V-joints tooled uniformly and smoothly with no double imprints.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students identify types of joints and jointer tools (E3.16.1).
2. Discuss the uses of the short V-jointer and the long V-jointer (E3.16.1, E3.16.2).
3. Demonstrate how to use the V-jointers (E3.16.3-E3.16.7).

SELECTED TOOLS AND MATERIALS

Trowel
V-jointers
Mortar
Mason's brush

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Masonry, Performance Objective 40. V-TECS.
Kentucky CBVE Instructional Materials, MY-5. Division of Materials and Curriculum.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.17 Point a wall

COURSE

Masonry II (8513)

3.17

PERFORMANCE OBJECTIVE

P3.17 Given a brick wall, tools, and supplies, point a wall. All joints must be full and finished.

SELECTED ENABLING OBJECTIVES

E3.17.1 Define pointing.

E3.17.2 Assemble tools and equipment needed to point a wall.

E3.17.3 Stand back from the wall and observe for cracks and holes.

E3.17.4 Chisel cracks where necessary.

E3.17.5 Wet cracks after chiseling.

E3.17.6 Place mortar in cracks and holes by using pointed trowel and tuck pointer, then brush.

E3.17.7 Refinish joints by matching previous jointing.

CRITERION-REFERENCED MEASURE

C3.17 Wall pointed with all joints full and finished.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss purposes of pointing (E3.17.1).
2. Have students identify locations where pointing is needed, and have them list all tools and materials necessary (E3.17.2, E3.17.3).
3. Demonstrate the procedure for pointing a wall (E3.17.3-E3.17.7).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Jointer (designated type)
Mortar
Pointing chisel
Pail
Water
Painter's brush
Mason's brush
Tuck pointer

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Kentucky CBVE Instructional Materials, MY-5. Division of Materials and Curriculum.
Masonry, Performance Objective 42. V-TECS.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

TASK / COMPETENCY

3.18 Cut a bat closure

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)

3.18

PERFORMANCE OBJECTIVE

P3.18 Given the necessary eye protection, tools, equipment, and supplies, cut a bat closure. The closure must be cut straight and equal to the predetermined size, allowing 3/8" clearance for mortar. All safety precautions must be observed.

SELECTED ENABLING OBJECTIVES

E3.18.1 List tools and equipment required to cut a bat closure.

E3.18.2 State safety precautions necessary when cutting a bat closure.

E3.18.3 Score a brick.

E3.18.4 Square a cut side of a brick with a hammer.

E3.18.5 Outline procedure for cutting a bat closure. Include: a) using eye safety protection, b) holding brick, c) scoring, d) striking, and e) squaring.

E3.18.6 Describe procedures for cutting queen and other types of closures.

CRITERION-REFERENCED MEASURE

C3.18 Bat closure cut straight and equal to the predetermined size with 3/8" clearance for mortar, and all safety precautions observed.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students list tools needed to perform task (E3.18.1).
2. Have students list and discuss safety precautions necessary when cutting a bat closure (E3.18.2).
3. Have students practice scoring, striking, and squaring bricks (E3.18.2, E3.18.3).
4. Demonstrate procedure for cutting a bat closure (E3.18.1-E3.18.6).
5. Demonstrate how to cut a queen closure and discuss variations in closure procedures (E3.18.6).

SELECTED TOOLS AND MATERIALS

Brick hammer
Brick set
Goggles
Pencil
Rule

SELECTED AUDIOVISUAL MATERIALS

Film:	*Basic Bricklaying* MH-1659. Structural Clay Products Institute.
Filmstrip/Cassette:	Installing Brick, *Masonry*. Singer Career Systems.

SELECTED REFERENCES

Masonry, Performance Objectives 20 and 21. V-TECS.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.19 Clean brick walls

COURSE

Masonry I (8512)
Masonry II (8513)

3.19

PERFORMANCE OBJECTIVE

P3.19 Given a brick wall and necessary equipment and supplies, clean the wall. All excess mortar and lime stains must be removed from the surface of the wall. All safety precautions must be observed.

SELECTED ENABLING OBJECTIVES

E3.19.1 Identify and name characteristics of various brick cleaning solutions.

E3.19.2 Read and outline directions for using acid solutions.

E3.19.3 Select tools and equipment.

E3.19.4 List steps for cleaning brick walls. Include: a) preparing, b) wetting, c) scrubbing, d) rinsing, and e) inspecting.

CRITERION-REFERENCED MEASURE

C3.19 Brick walls cleaned with all excess mortar and lime stains removed from the surface of the wall; all safety precautions observed.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Display types of brick cleaning solutions (E3.19.1).
2. Have students list and explain safety precautions necessary when using acid solutions (E3.19.2).
3. Have students list tools and equipment needed to clean brick wall (E3.19.3).
4. Have students list and explain the steps in cleaning a brick wall (E3.19.4).

SELECTED TOOLS AND MATERIALS

Cleaning solution
Bucket
Water
Metal scraper
Wire brush
Water hose
Long-handled scrub brush
Rubber gloves

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Kentucky CBVE Instructional Materials, MY-26. Division of Materials and Curriculum. Masonry, Performance Objective 17. V-TECS.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.20 Lay running bond pattern in concrete masonry

COURSE

Masonry II (8513)

3.20

PERFORMANCE OBJECTIVE

P3.20 Given necessary equipment, tools, supplies, and building specifications, lay a 4" concrete block wall in running bond pattern. The wall must be straight, level, and plumb. Joints must be equalized vertically and horizontally, and vertical joints must be in alignment.

SELECTED ENABLING OBJECTIVES

E3.20.1 Assemble tools, equipment, and supplies needed to lay a 4" concrete block wall. Include: a) line, b) line holder, and c) reinforcement wire.

E3.20.2 Outline and demonstrate procedure for laying a concrete block wall in running bond pattern. Include: a) pointing, b) bonding, c) building leads, d) lining and laying out wall, e) placing reinforcement wire horizontally and vertically, f) building additional leads, and g) continuing procedure until height of wall is reached.

CRITERION-REFERENCED MEASURE

C3.20 Concrete block wall in running bond pattern constructed; wall is straight, level, and plumb. Joints equalized vertically and horizontally, and vertical joints are in alignment.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Display tools, materials, supplies, and discuss specifications (E3.20.1).
2. Demonstrate procedure and techniques used in laying concrete masonry in running bond pattern (E3.20.2).
3. Have students practice this procedure (E3.20.2).
4. Arrange a field trip to local building site where concrete masonry is being used in the construction (E3.20.1, E3.20.2).

SELECTED TOOLS AND MATERIALS

- Trowel
- Brick hammer
- Plumb rule
- Rule
- Striking tool
- Mason's line
- Gauge stick
- 4" concrete/cinder blocks
- Square
- Jointer
- Safety hat
- Wheelbarrow
- Mortar
- Set of line blocks
- Mortar stand
- Mortar board
- Mason's brush
- Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Block (Unit 4), Masonry. Career Aids, Inc.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Cement Mason's Manual for Residential Construction. Portland Cement Association.
Concrete Masonry Vocational Training. Toennies and Merten.
Masonry, Performance Objective 66. V-TECS.
Masonry Skills. Kreh.
Modern Masonry. Kicklighter.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

3.21 Lay vertical bond pattern in concrete masonry

COURSE

Masonry II (8513)

3.21

PERFORMANCE OBJECTIVE

P3.21 Given necessary equipment, tools, supplies, and building specifications, lay a 4" concrete block wall in vertical bond pattern. Wall must be straight, level, and plumb with equalized joints vertically and horizontally. Vertical joints must be plumb and uninterrupted throughout the entire wall.

SELECTED ENABLING OBJECTIVES

E3.21.1 Distinguish between vertical bond pattern and running bond pattern.

E3.21.2 Assemble required tools, materials, and equipment.

E3.21.3 Outline and demonstrate procedure for laying vertical bond pattern. Include: a) pointing, b) bonding out, c) building leads, d) lining with line holder or line blocks, and e) laying concrete caps on top of wall.

CRITERION-REFERENCED MEASURE

C3.21 Concrete block wall in vertical bond pattern constructed and wall is straight, level, and plumb. Joints equalized vertically and horizontally, and vertical joints plumb and uninterrupted throughout entire wall.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students point out differences in vertical bond and running bond patterns (E3.21.1).
2. Discuss the exactness required when using vertical bond. Have students explain the allowance that can be made with running bond (E3.21.1).
3. Demonstrate how to lay vertical bond in concrete masonry. Allow students practice time to return demonstration (E3.21.1.-E3.21.3).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Gauge stick
4" concrete/cinder blocks
Square
Jointer
Safety hat
Wheelbarrow
Mortar
Mortar stand
Mortar board
Set of line blocks

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Cement Mason's Manual for Residential Construction. Portland Cement Association.
Concrete Masonry Vocational Training. Toennies and Merten.
Masonry, Performance Objective 67. V-TECS.
Masonry Skills. Kreh.
Modern Masonry. Kicklighter.

Application

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.22 Gauge masonry wall with story pole

COURSE

Masonry I (8512)
Masonry II (8513)

3.22

PERFORMANCE OBJECTIVE

P3.22 Given the necessary equipment and supplies, gauge a masonry wall with a story pole. Story pole must be placed at the bottom of the first course and marked on 6 with spacing rule, and all courses must be gauged on 6 with the story pole.

SELECTED ENABLING OBJECTIVES

E3.22.1 Obtain a piece of straight wood to serve as story pole.

E3.22.2 Demonstrate marking designated gauge on story pole.

E3.22.3 Explain where to place story pole.

E3.22.4 Outline procedure to gauge courses.

CRITERION-REFERENCED MEASURE

C3.22 Masonry wall gauged with story pole; pole placed at bottom of first course and marked on 6 with spacing rule, and all courses gauged on 6 with story pole.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Explain purpose of using story pole to gauge masonry (E3.22.1-E3.22.4).
2. Demonstrate how to gauge a masonry wall with a story pole. Have students practice gauging a wall (E3.22.1-E3.22.4).

SELECTED TOOLS AND MATERIALS

Wall
Story pole
Marking equipment

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Kentucky CBVE Instructional Materials, MY-7. Division of Materials and Curriculum.
Masonry, Performance Objective 24. V-TECS.

DUTY AREA

3. DEVELOPING LAYING, JOINTING, AND POINTING SKILLS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

3.23 Lay specialized patterns

COURSE

Masonry II (8513)

3.23

PERFORMANCE OBJECTIVE

P3.23 Given the necessary equipment, tools, supplies, and building specifications, lay a herringbone, diamond, or basketweave pattern. All bricks must be laid according to specifications and instructor's demonstration.

SELECTED ENABLING OBJECTIVES

E3.23.1 Assemble necessary supplies and equipment.

E3.23.2 Identify various types of specialized patterns.

E3.23.3 Explain the common uses of specialized patterns.

E3.23.4 Outline procedure for laying designated specialized pattern(s).

CRITERION-REFERENCED MEASURE

C3.23 Specialized pattern laid according to specifications and instructor's demonstration.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Describe and provide illustrations of herringbone, diamond, and basketweave patterns (E3.23.2).

2. Discuss the common uses of these patterns and the brick types used (E3.23.3).

3. Demonstrate how to lay herringbone, diamond, and basketweave patterns. Provide students with V-TECS performance guides or other specifications (E3.23.1-E3.23.4).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Gauge stick
Jointer

Brick
Mortar
Mortar stand
Mortar board
Set of line blocks
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: "Installing Brick," *Masonry*. Singer Career Systems.

SELECTED REFERENCES

Bricklaying Vocational Training. Roark and Plummer.
Kentucky CBVE Instructional Materials, MY-16, MY-18, MY-21. Division of Materials and Curriculum.
Masonry, Performance Objectives 25, 27, and 30. V-TECS.

DUTY AREA

4. PREPARING FOUNDATIONS AND FOOTINGS

TASKS/COMPETENCIES

4.1. Mix and pour concrete

4.2 Set up batter boards

4.3 Construct wall containing pilasters

DUTY AREA

4. PREPARING FOUNDATIONS AND FOOTINGS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

4.1 Mix and pour concrete

COURSE

Masonry II (8513)

4.1

PERFORMANCE OBJECTIVE

P4.1 Given a completed concrete form, specifications, necessary tools, equipment, and supplies, mix and pour concrete according to specifications. Ingredients must be measured accurately and thoroughly mixed, and mixture must have uniform color and quality and must slide gradually from the trowel.

SELECTED ENABLING OBJECTIVES

E4.1.1 Define: screeding and floating.

E4.1.2 Explain ratio and proportion.

E4.1.3 List the ingredients for concrete.

E4.1.4 Identify tools needed for finishing concrete.

E4.1.5 Explain the coating of forming material.

E4.1.6 List and demonstrate steps for mixing and pouring concrete.

CRITERION-REFERENCED MEASURE

C4.1 Concrete mixed and poured according to specifications with ingredients measured accurately and mixed thoroughly. Mixture is of uniform color and quality and slides gradually from the trowel.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Define, explain, and discuss key terms and concepts related to concrete. Include ratio, proportion, screeding, floating, and coating of forming material (E4.1.1-E4.1.5).
2. Have students list all tools and materials needed for mixing, pouring, and finishing concrete (E4.1.3, E4.1.4).
3. Have students demonstrate steps for mixing, pouring, and finishing concrete (E4.1.6).

SELECTED TOOLS AND MATERIALS

Concrete trowel
Mixing box
Mixing hoe
Screed board
Wood float
Edger
Specifications

SELECTED AUDIOVISUAL MATERIALS

Film: Foundations. Circle Oak Productions.

SELECTED REFERENCES

Cement Mason's Manual for Residential Construction. Portland Cement Association.
Concrete Masonry Vocational Training. Toennies and Merten.

DUTY AREA

4. PREPARING FOUNDATIONS AND FOOTINGS

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

4.2 Set up batter boards

COURSE

Masonry II (8513)

4.2

PERFORMANCE OBJECTIVE

P4.2 Given the necessary tools, equipment, and supplies, a building plan, and marked reference points, set up batter boards to locate the exact layout of each outside wall in the structure. Batter boards are to be set so as not to interfere with the construction process.

SELECTED ENABLING OBJECTIVES

E4.2.1 Define terminology related to setting up and making use of batter boards.

E4.2.2 Explain the purpose of batter boards.

E4.2.3 Read and interpret building plan (blueprints).

E4.2.4 List and demonstrate steps for setting up batter boards.

CRITERION-REFERENCED MEASURE

C4.2 Batter boards set up locating the exact layout of each outside wall in the structure and in such a way as to not interfere with the construction process.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Lead discussion on the purpose of batter boards. Place special emphasis on need for precision and building efficiency (E4.2.1, E4.2.2).
2. Demonstrate how to set up batter boards according to building plan (E4.2.4).
3. Visit building sites and have students identify the batter boards (E4.2.1-E4.2.4).

SELECTED TOOLS AND MATERIALS

Rule
Claw hammer
Wooden stakes
1 x 6 sheathing
Axe/sledge hammer
Square
Safety hat
Hand circular saw
8^{d} nails

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Bricklaying Vocational Training. Roark and Plummer.
The World of Construction. Lux and Ray.

DUTY AREA

4. PREPARING FOUNDATIONS AND FOOTINGS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

4.3 Construct wall containing pilasters

COURSE

Masonry II (8513)

4.3

PERFORMANCE OBJECTIVE

P4.3 Given the necessary equipment and building specifications, construct a wall containing pilasters. Each pilaster must be level, plumb, square with the wall, and anchored solidly to the wall.

SELECTED ENABLING OBJECTIVES

E4.3.1 Define pilaster and full head joint.

E4.3.2 Explain why pilasters must be built with full head joints.

E4.3.3 Outline and demonstrate procedure for constructing a wall containing pilasters:

a. Determine where pilaster is to be located in wall.
b. Determine dimension of pilaster.
c. Lay out and bond pilaster in wall, making sure pilaster is square and parallel with face of wall.
d. Place anchors or metal ties in pilaster wall.
e. Build around and flush anchors or ties with mortar.
f. Continue to build pilaster as wall progresses.

CRITERION-REFERENCED MEASURE

C4.3 Wall containing pilasters constructed with each pilaster level, plumb, square with the wall, and anchored solidly to the wall.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss key terms and concepts related to pilasters and wall construction (E4.3.1, E4.3.2).

2. Demonstrate how to construct a wall containing pilasters (E4.3.3).

SELECTED TOOLS AND MATERIALS

Anchors or ties
Mortar
Trowel
Level
Brick hammer

SELECTED AUDIOVISUAL MATERIALS

Film: Foundations. Circle Oak Productions.

SELECTED REFERENCES

Cement Mason's Manual for Residential Construction. Portland Cement Association.
Concrete Masonry Vocational Training. Toennies and Merten.
Masonry, Performance Objective 8. V-TECS.

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

TASKS/COMPETENCIES

5.1 Construct a partition

5.2 Construct a jamb

5.3 Construct sills (rowlock)

5.4 Set lintels

5.5 Set window

5.6 Lay a flight of steps

5.7 Construct piers

5.8 Fasten brick veneer, using corrugated wall ties

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

5.1 Construct a partition

COURSE

Masonry II (8513)

5.1

PERFORMANCE OBJECTIVE

P5.1 Given the necessary equipment, tools, supplies, and building specifications, construct an 8" brick partition. Partition wall must be level, plumb, and tooled according to specifications.

SELECTED ENABLING OBJECTIVES

E5.1.1 Define partition and other terms related to constructing a partition.

E5.1.2 Identify tools needed to construct a partition.

E5.1.3 List the steps to be taken in constructing a partition.

CRITERION-REFERENCED MEASURE

C5.1 Eight-inch brick partition constructed and partition is level, plumb, and tooled according to specifications.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Explain how partitions are used in buildings (E5.1.1).
2. Demonstrate the construction of a partition (E5.1.2, E5.1.3).
3. Arrange for students to visit a construction site to see paritions being constructed (E5.1.1-E5.1.3).
4. Allow shop time for students to practice constructing a partition (E5.1.3).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Gauge stick
Square
Jointer
Safety hat
Brick
Mortar
Mortar board/stand
Mason's brush
Line pin/blocks
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklaying Training Series. Career Aids, Inc.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Masonry Skills. Kreh.

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

5.2 Construct a jamb

COURSE

Masonry I (8512)

5.2

PERFORMANCE OBJECTIVE

P5.2 Given the necessary equipment, tools, supplies, and building specifications, construct an 8" jamb. Jamb must be level, plumb, square, and tooled according to specifications.

SELECTED ENABLING OBJECTIVES

E5.2.1 Define terms related to constructing a jamb.

E5.2.2 Explain construction and functions of jambs.

E5.2.3 Outline and demonstrate procedure to be followed when constructing a jamb.

CRITERION-REFERENCED MEASURE

C5.2 Eight-inch jamb constructed according to specifications; jamb is level, plumb, square, and tooled.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Make available a completed jamb and allow students to examine its construction (E5.2.1, E5.2.2).
2. Demonstrate the proper technique and procedure to be followed in constructing a jamb (E5.2.3).
3. Have students practice constructing jambs (E5.2.3).
4. Show filmstrip or slides and review sequence of steps with class (E5.2.1-E5.2.3).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Gauge stick
Square
Jointer
Safety hat
Wheelbarrow
Brick
Mortar
Mortar board/stand
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklaying Training Series. Career Aids, Inc.
Filmstrip/Cassette: Jambs, Sills and Lintels, Advanced Masonry Skills. Prentice-Hall Media.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Modern Masonry. Kicklighter.

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

5.3 Construct sills (rowlock)

COURSE

Masonry II (8513)

5.3

PERFORMANCE OBJECTIVE

P5.3 Given necessary equipment, supplies, and building specifications, build a rowlock window sill. All bricks must be smooth and tight against the bottom of the window, all head joints must be equalized, and fall must be away from the window. Projection of bricks must be equalized, and joints must be tooled according to specifications.

SELECTED ENABLING OBJECTIVES

E5.3.1 Describe construction of a rowlock window sill.

E5.3.2 Assemble equipment, supplies, and tools required to build a rowlock window sill.

E5.3.3 Install flashing.

E5.3.4 Determine projection and desired fall.

E5.3.5 Cut brick to desired projection and fall.

E5.3.6 Course window sill to determine amount of brick needed.

E5.3.7 Spread mortar.

E5.3.8 Lay sill in place on courses.

E5.3.9 Tool joints.

E5.3.10 Remove excess mortar.

CRITERION-REFERENCED MEASURE

C5.3 Rowlock window sill constructed with all bricks smooth and tight against the bottom of the window, all head joints equalized, and fall is away from the window. Projection of bricks is equalized, and joints are tooled according to specifications.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Review study of laying a rowlock course (E5.3.1).
2. Have students inspect windows with brick sills. Point out construction techniques (E5.3.1).
3. Demonstrate proper technique for laying brick in rowlock to construct a window sill. Provide ample shop time for students to practice this technique (E5.3.1-E5.3.10).
4. Show filmstrip or slides and discuss (E5.3.1-E5.3.10).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Jointer
Safety hat
Brick
Mortar
Mortar board/stand
Line pin
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides:	Bricklaying Training Series. Career Aids, Inc.
Filmstrip/Cassette:	Jambs, Sills, and Lintels, Advanced Masonry Skills. Prentice-Hall Media.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Kentucky CBVE Instructional Materials, MY-31. Division of Materials and Curriculum.
Masonry, Performance Objective 59. V-TECS.

— Application —

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

5.4 Set lintels

COURSE

Masonry II (8513)

5.4

PERFORMANCE OBJECTIVE

P5.4 Given necessary equipment, tools, and building specifications, set a lintel. Lintel must have a minimum of 8" bearing, must be level without resting on top of frame, and plumb with the face of the wall.

SELECTED ENABLING OBJECTIVES

E5.4.1 Define terms related to lintel construction.

E5.4.2 Assemble equipment, tools, and materials required to set a lintel.

E5.4.3 Cite reasons for minimum 8" bearings across top of opening on both sides of lintel.

E5.4.4 Spread solid bed of mortar where lintel is to be set.

E5.4.5 Raise, wedge, and set lintel in mortar on 8" bearings.

E5.4.6 Level and plumb lintel with face to wall.

E5.4.7 Finish joints.

CRITERION-REFERENCED MEASURE

C5.4 Lintel set with a minimum of 8" bearing, is level without resting on top of frame, and is plumb with face of the wall.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Explain the differences in block and steel lintels and describe appropriate uses of each (E5.4.1-E5.4.3).
2. Discuss the purposes of lintels (E5.4.1).
3. Demonstrate the correct procedure to follow when setting lintels (E5.4.2-E5.4.7).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Jointer
Safety hat
Mortar
Lintel
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Jambs, Sills, and Lintels, Advanced Masonry Skills. Prentice-Hall Media.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Masonry, Performance Objective 64. V-TECS.

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

TASK / COMPETENCY

5.5 Set window

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

5.5

PERFORMANCE OBJECTIVE

P5.5 Given necessary equipment, tools, and building specifications, set a window. Sides, bottom, and top of window must fit tightly in window opening, and frames must stand vertically plumb and square with the wall. The window must open, close, and lock.

SELECTED ENABLING OBJECTIVES

E5.5.1 Assemble necessary equipment, tools, and supplies to set a window.

E5.5.2 Define the following: jamb, lintel, sash end block, wedge, and flashing.

E5.5.3 Measure window size.

E5.5.4 Lay out window according to specified dimensions.

E5.5.5 Build up window jamb to lintel using sash end blocks.

E5.5.6 Slide window in sash end blocks from top down.

E5.5.7 Place lintel horizontally across top of window opening.

E5.5.8 Shove window upward and tight against bottom of lintel and wedge.

CRITERION-REFERENCED MEASURE

C5.5 Window set with sides, bottom, and top of window tightly fit in window opening and frames stand vertically plumb and square with wall. Window opens, closes, and locks.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Demonstrate how to set window, being careful to point out need for window to move freely (E5.5.1-E5.5.8).
2. Have students identify areas of window construction which must be planned and allowed for in advance, such as dimensions of furring, striping, and plaster (E5.5.2).
3. Arrange a field trip to a site where windows are being installed (E5.5.3-E5.5.8).
4. Have students practice setting windows (E5.5.1-E5.5.8).

SELECTED TOOLS AND MATERIALS

Plumb rule
Rule
Mason's line
Square
Safety hat
Claw hammer
#8d nails
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassette: Rough Stairs, Installing Windows and Doors, Ceiling Joists, Roof Framing and Sheathing, Finishing the Roof (Unit 3), Building Construction Exterior. Career Aids, Inc.

Framing and Installing a Window Unit, Exterior Construction. Singer Career Systems.

SELECTED REFERENCES

Kentucky CBVE Instructional Materials, MY-33. Division of Materials and Curriculum.
Masonry, Performance Objective 65. V-TECS.
The World of Construction. Lux and Ray.

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

5.6 Lay a flight of steps

COURSE

Masonry II (8513)

5.6

PERFORMANCE OBJECTIVE

P5.6 Given equipment, tools, supplies, and building specifications, lay three brick steps. Steps must be laid 3' x 3' with 7" risers, 12" treads, and specified fall and must be level, plumb, straight-edged, and aligned. Joints must be finished according to specifications.

SELECTED ENABLING OBJECTIVES

E5.6.1 Assemble equipment, tools, and supplies required for laying three brick steps.

E5.6.2 Measure 3 from given point.

E5.6.3 Mark and square.

E5.6.4 Dry bond with stretcher course.

E5.6.5 Fill in backup area.

E5.6.6 Dry bond and mark two rowlock courses back to back.

E5.6.7 Fill in backup area.

E5.6.8 Measure in 12".

E5.6.9 Continue procedure for additional steps.

CRITERION-REFERENCED MEASURE

C5.6 Flight of steps laid 3' x 3' with 7" risers, 12" treads, and specified fall. Steps are level, plumb, straight-edged, and aligned with joints finished according to specifications.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Demonstrate how to measure, mark, square, and lay a flight of steps (E5.6.1-E5.6.9).
2. Have students explain in detail the procedure for laying a flight of stairs (E5.6.1-E5.6.9).
3. Have students practice laying flight of steps, following teacher demonstration (E5.6.1-E5.6.9).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Gauge stick
Square
Jointer

Safety hat
Brick
Mortar
Mortar board/stand
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Step Construction, Advanced Masonry Skills. Prentice-Hall Media.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Kentucky CBVE Instructional Materials, MY-50. Division of Materials and Curriculum.
Masonry, Performance Objective 61. V-TECS.
Modern Masonry. Kicklighter.

Application

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

5.7 Construct piers

COURSE

Masonry I (8512)

5.7

PERFORMANCE OBJECTIVE

P5.7 Given necessary equipment, supplies, and building specifications, construct a 16" x 20" pier. Pier must be square, level, plumb, and straight-edged. All work must be jointed and free of cracks and holes.

SELECTED ENABLING OBJECTIVES

E5.7.1 Assemble materials, supplies, and equipment.

E5.7.2 Dimension, square, and mark an area for pier, according to specifications.

E5.7.3 Lay and level corner unit.

E5.7.4 Lay and straight-edge first course level.

E5.7.5 Lay units in reverse direction.

E5.7.6 Level and plumb from corner to corner.

E5.7.7 Continue course level and reverse-direction process to reach desired height.

E5.7.8 Tool joints.

CRITERION-REFERENCED MEASURE

C5.7 16" x 20" pier is square, level, plumb, and straight-edged; all work jointed and free of cracks and holes.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students identify the kinds of building projects that might include brick piers (E5.7.1-E5.7.8).
2. Display various photographs or illustrations of homes or buildings where piers have been used (E5.7.1-E5.7.8).
3. Demonstrate the construction of a brick pier, emphasizing the importance of squaring, leveling, and plumbing (E5.7.1-E5.7.8).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Gauge stick
Square
Jointer
Safety hat
Brick
Mortar
Mortar board/stand
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Brick - Part B (Unit III), Masonry. Career Aids, Inc.

SELECTED REFERENCES

Bricklaying Curriculum. Oklahoma State Department of Vocational and Technical Education.
Kentucky CBVE Instructional Materials, MY-30. Division of Materials and Curriculum.
Masonry, Performance Objective 7. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

5. CONSTRUCTING BRICK STRUCTURES

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

5.8 Fasten brick veneer, using corrugated wall ties

COURSE

Masonry I (8512)

5.8

PERFORMANCE OBJECTIVE

P5.8 Given necessary equipment and supplies, fasten brick wall to stud framing, using corrugated metal ties and # 8^d nails. Ties are to be installed 2 feet apart horizontally and every 16 inches in elevation.

SELECTED ENABLING OBJECTIVES

E5.8.1 Define terms related to fastening brick veneer.

E5.8.2 Identify tools and equipment used in fastening brick veneer.

E5.8.3 Outline and demonstrate procedure for fastening brick veneer.

CRITERION-REFERENCED MEASURE

C5.8 Brick veneer fastened, using corrugated wall ties and nails; ties installed 2 feet apart horizontally and every 16 inches in elevation.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss reasons for using veneer and advantages/disadvantages of veneer against solid brick (E5.8.1).
2. Demonstrate the procedure for fastening brick veneer using corrugated metal ties (E5.8.2, E5.8.3).
3. Have students return demonstration (E5.8.2, E5.8.3).

SELECTED TOOLS AND MATERIALS

Brick hammer
Rule
Safety hat
Corrugated metal ties
#8^{d} nails

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	Installing Siding and Brick Veneer, Completing the Exterior. Career Aids, Inc.

SELECTED REFERENCES

Bricklaying Vocational Training. Roark and Plummer.
Masonry, Performance Objective 18. V-TECS.
Modern Masonry, p. 141. Kicklighter.

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

TASKS/COMPETENCIES

6.1 Erect scaffolding

6.2 Build a double face chimney (smoke chamber)

6.3 Build a single face chimney (smoke shelf)

6.4 Cut a flue lining

6.5 Install an ash dump

6.6 Install a clean-out door

6.7 Insert a damper

6.8 Lay a hearth

6.9 Lay a mantel

6.10 Construct firebox

— Application —

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

6.1 Erect scaffolding

COURSE

Masonry II (8513)

6.1

PERFORMANCE OBJECTIVE

P6.1 Given the necessary supplies and equipment, erect a section of tubular steel scaffolding in accordance with instructor demonstration. Completed scaffold must be in compliance with industry and OSHA standards.

SELECTED ENABLING OBJECTIVES

E6.1.1 Identify types of scaffolds.

E6.1.2 List and explain safety features which are required by law.

E6.1.3 Outline a step-by-step procedure to erect scaffolds. Note all safety precautions.

E6.1.4 Identify all components of a scaffold.

CRITERION-REFERENCED MEASURE

C6.1 Scaffold erected in accordance with instructor demonstration; completed scaffold is in compliance with industry and OSHA standards.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss with students the types and uses of scaffolds (E6.1.1).
2. Explain OSHA requirements for scaffolds (E6.1.2).
3. Arrange for students to visit a construction site where scaffolds have been erected. Have students identify the types of scaffolds, safety features, and scaffolding components (E6.1.1-E6.1.4).
4. Erect a section of scaffold in the shop. Emphasize all safety precautions (E6.1.1-E6.1.4).

SELECTED TOOLS AND MATERIALS

Tubular steel scaffolding
Scaffolding boards
Bucks
Braces
Pins

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Ladders and Scaffolds, Safety in Residential Construction. Prentice-Hall Media.

SELECTED REFERENCES

Masonry Skills. Kreh.
Masonry Worker, pp. 35-36. V-TECS.

Application

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

TASK / COMPETENCY

6.2 Build a double face chimney (smoke chamber)

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

6.2

PERFORMANCE OBJECTIVE

P6.2 Given necessary equipment, tools, and building specifications, build a smoke chamber. Corbeling must not exceed 1½" per course, all courses must be evenly corbeled, and all joints must have full head joints.

SELECTED ENABLING OBJECTIVES

E6.2.1 Distinguish between a single face and a double face chimney (smoke chamber and smoke shelf).

E6.2.2 Define flue, damper, and flue lining.

E6.2.3 Assemble materials, equipment, and tools required to build a double face chimney.

E6.2.4 Demonstrate the following processes: a) corbeling, and b) plastering.

E6.2.5 Outline procedure for building chimney, using building specifications.

E6.2.6 Install flue.

E6.2.7 Install flue lining.

E6.2.8 Install damper.

CRITERION-REFERENCED MEASURE

C6.2 Smoke chamber built according to specifications with corbeling not exceeding 1½" per course; all courses are evenly corbeled, and all joints have full head joints.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students discuss key terms and concepts related to chimney construction (E6.2.1, E6.2.2).
2. Demonstrate techniques used in corbeling and plastering. Have students return demonstration by practicing corbeling (E6.2.4).
3. Arrange student field trip to construction sites where chimneys are being built (E6.2.1-E6.2.8).
4. Demonstrate installation of flue, flue lining, and damper (E6.2.6-E6.2.8).

SELECTED TOOLS AND MATERIALS

Trowel
Plumb rule
Rule
Square
Safety hat
Brick
Mortar
Brick hammer
Mortar board/stand
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplaces and Wood Stoves. Time-Life Books.
Kentucky CBVE Instructional Materials, MY-38. Division of Materials and Curriculum.
Masonry, Performance Objective 46. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

TASK / COMPETENCY

6.3 Build a single face chimney (smoke shelf)

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

6.3

PERFORMANCE OBJECTIVE

P6.3 Given necessary equipment, tools, and building specifications, build a smoke shelf. The smoke shelf must be directly under the bottom of the flue, must extend the full width of the throat, and be constructed horizontally. All excess masonry material must be removed from around the damper.

SELECTED ENABLING OBJECTIVES

E6.3.1 Define single face chimney (smoke shelf), double face chimney (smoke chamber), flue, flue throat, and damper.

E6.3.2 List materials, equipment, and tools required to build a smoke shelf.

E6.3.3 Outline procedure for building smoke shelf, using building specifications.

E6.3.4 Spread mortar horizontally on top of fill material.

E6.3.5 Smooth mortar horizontally on top of fill material behind damper.

CRITERION-REFERENCED MEASURE

C6.3 Smoke shelf built according to specifications and is directly under the bottom of the flue, extends the full width of the throat, and is constructed horizontally. All excess masonry material is removed from around damper.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students define key terms related to single face chimney construction (E6.3.1).
2. Demonstrate the construction of a single face chimney (E6.3.2-E6.3.5).
3. Arrange field trips to construction sites where chimneys are being built (E6.3.1-E6.3.5).
4. Have students practice constructing a single face chimney (E6.3.2-E6.3.5).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Rule
Plumb rule
Square
Safety hat
Brick
Mortar
Mortar board/stand
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplaces and Wood Stoves. Time-Life Books.
Kentucky CBVE Instructional Materials, MY-38. Division of Materials and Curriculum.
Masonry, Performance Objective 47. V-TECS.
Modern Masonry. Kicklighter.

Application

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

6.3 Cut a flue lining

COURSE

Masonry II (8513)

6.4

PERFORMANCE OBJECTIVE

P6.4 Given necessary equipment, safety shield, tools, supplies, and specifications, cut a flue lining. The flue lining must be cut along the marked line with no cracks or breaks in the lining. All safety procedures must be observed.

SELECTED ENABLING OBJECTIVES

E6.4.1 Assemble materials, tools, equipment, and supplies required to cut a flue lining.

E6.4.2 Interpret building specifications.

E6.4.3 Measure length.

E6.4.4 Trace line.

E6.4.5 Fill flue lining with sand.

E6.4.6 Pack sand.

E6.4.7 Tap line.

E6.4.8 Cut flue lining.

CRITERION-REFERENCED MEASURE

C6.4 Flue lining cut along marked line with no cracks or breaks in the lining and with all safety procedures observed.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Describe the purpose of flue lining (E6.4.1).
2. Discuss the method used to cut a flue lining. Emphasize the importance of using sand in and around the flue (E6.4.1-E6.4.7).
3. Demonstrate how to cut a flue lining, emphasizing all safety precautions (E6.4.8).
4. Have students cut a flue lining (E6.4.1-E6.4.8).

SELECTED TOOLS AND MATERIALS

Brick hammer
Rule
Blocking chisel
Safety hat
Safety shield
Goggles
Sand
Specifications

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: Building a Chimney, Basic Masonry Skills. Prentice-Hall Media.
Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplaces and Wood Stoves. Time-Life Books.
Kentucky CBVE Instructional Materials, MY-12. Division of Materials and Curriculum.
Masonry, Performance Objective 48. V-TECS.
Masonry Skills, pp. 194-195. Kreh.
Modern Masonry. Kicklighter.

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

TASK / COMPETENCY

6.5 Install ash dump

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

6.5

PERFORMANCE OBJECTIVE

P6.5 Given necessary equipment, tools, supplies, and specifications, install an ash dump. The ash dump must fit in center of fire brick floor within 2 to 3 inches of back of fire box, and door must swing to the back of fire box when open.

SELECTED ENABLING OBJECTIVES

E6.5.1 Define ash dump, fire box, and fire brick.

E6.5.2 Outline installation procedure, using building specifications.

E6.5.3 Measure size.

E6.5.4 Establish center point of fire box.

E6.5.5 Measure from back of fire box (2 or 3 inches).

E6.5.6 Cut fire brick in floor to fit desired opening.

E6.5.7 Place ash dump over opening.

CRITERION-REFERENCED MEASURE

C6.5 Ash dump fits in center of fire brick floor within 2 to 3 inches of back of fire box, and door swings to the back of fire box when opened.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss key terms related to ash dump installation (E6.5.1).
2. Have students explain ash dump installation procedures (E6.5.1-E6.5.7).
3. Demonstrate installation of ash dump (E6.5.1-E6.5.7).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Rule
Square
Jointer
Safety hat
Fire brick
Fire clay
Ash dump door
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplace and Wood Stoves. Time-Life Books.
Kentucky CVBE Instructional Materials, MY-37. Division of Materials and Curriculum.
Masonry, Performance Objective 49. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

TASK / COMPETENCY

6.6 Install clean-out door

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

6.6

PERFORMANCE OBJECTIVE

P6.6 Given necessary equipment, tools, supplies, and specifications, install a chimney clean-out door. Installed door should be level and plumb with bricks laid tightly behind the lip of the door.

SELECTED ENABLING OBJECTIVES

E6.6.1 Assemble materials, tools, and supplies required to install a chimney clean-out door.

E6.6.2 Outline clean-out door installation procedure, using building or manufacturer's specifications.

E6.6.3 Determine door size.

E6.6.4 Measure to center of chimney.

E6.6.5 Center door to chimney center.

E6.6.6 Plumb and level door.

E6.6.7 Brick tightly to behind lip of door.

E6.6.8 Anchor door to bricks.

E6.6.9 Place lintel.

E6.6.10 Describe construction of completed chimney.

CRITERION-REFERENCED MEASURE

C6.6 Clean-out door installed according to specifications and is level and plumb with bricks laid tightly behind the lip of the door.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Display a completed chimney and provide students with opportunity to ask questions about its construction (E6.6.1-E6.6.10).
2. Discuss the purpose and proper placement of a clean-out door (E6.6.2, E6.6.3).
3. Demonstrate all steps to be taken in installing clean-out door (E6.6.1-E6.6.10).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Jointer
Safety hat
Brick
Mortar
Mortar board/stand

Clean-out door
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplace and Wood Stoves. Time-Life Books.
Kentucky CBVE Instructional Materials, MY-36. Division of Materials and Curriculum.
Masonry, Performance Objective 50. V-TECS.
Modern Masonry. Kicklighter.

— Application —

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

TASK / COMPETENCY

6.7 Insert a damper

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

6.7

PERFORMANCE OBJECTIVE

P6.7 Given the necessary equipment, tools, supplies, and specifications, insert a damper. When open, the inserted damper must draw all smoke forcefully up the throat of the chimney.

SELECTED ENABLING OBJECTIVES

E6.7.1 Describe construction of a completed chimney.

E6.7.2 Explain purpose of a damper.

E6.7.3 List equipment, tools, and supplies required to insert damper.

E6.7.4 Use specifications to determine assembly procedures for damper door, door catch or stopper, and door handle.

E6.7.5 Outline damper insertion procedures.

E6.7.6 Assemble parts.

E6.7.7 Embed flange.

E6.7.8 Align damper with front face of fire bricks.

E6.7.9 Seal.

CRITERION-REFERENCED MEASURE

C6.7 Damper inserted properly so that when open, smoke is drawn forcefully up the throat of the chimney.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Make available a completed chimney so that students may examine an inserted damper (E6.7.1).
2. Discuss the purpose and operation of a damper (E6.7.2).
3. Demonstrate the procedure to be followed when inserting a damper (E6.7.3-E6.7.9).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Safety hat
Brick
Mortar
Mortar board/stand

Damper
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplace and Wood Stoves. Time-Life Books.
Kentucky CBVE Instructional Materials, MY-38. Division of Materials and Curriculum.
Masonry, Performance Objective 51. V-TECS.
Modern Masonry. Kicklighter.

Application

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

6.8 Lay a hearth

COURSE

Masonry II (8513)

6.8

PERFORMANCE OBJECTIVE

P6.8 Given necessary equipment, tools, supplies, and specifications, lay a hearth. The hearth must be level, square, and plumb with full joints and must be set in a 3/8" mortar bed. Top of hearth must be level with fire box floor (inner hearth).

SELECTED ENABLING OBJECTIVES

E6.8.1 Explain purposes of a hearth.

E6.8.2 Assemble equipment, tools, and supplies required to lay a hearth.

E6.8.3 Determine hearth arrangement, using building specifications.

E6.8.4 Outline procedure for laying a hearth.

E6.8.5 Bond and lay out the outside of a hearth.

E6.8.6 Fill inside of hearth with masonry material.

E6.8.7 Lay hearth level with fire box floor.

E6.8.8 Point and tool joints.

CRITERION-REFERENCED MEASURE

C6.8 Hearth laid according to specifications and is level, square, and plumb with full joints and set in a 3/8" mortar bed. Top of hearth is level with fire box floor.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss the purposes of a hearth (E6.8.1).
2. Discuss building specifications as they relate to hearth arrangement (E6.8.3).
3. Provide students with illustrations of various hearth arrangements (E6.8.1-E6.8.3).
4. Demonstrate the procedure used to lay a hearth (E6.8.2-E6.8.8).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Square
Jointer
Safety hat
Brick
Mortar
Mortar board
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplace and Wood Stoves. Time-Life Books.
Kentucky CBVE Instructional Materials, MY-40. Division of Materials and Curriculum.
Masonry, Performance Objective 53. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

6. CONSTRUCTING CHIMNEYS AND FIREPLACES

TASK/COMPETENCY

6.9 Lay a mantel

Application

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

6.9

PERFORMANCE OBJECTIVE

P6.9 Given the necessary equipment, tools, supplies, and building specifications, lay a mantel. Each corbel must not project more than 1 inch, and each corbel course must be straight, level, and plumb.

SELECTED ENABLING OBJECTIVES

E6.9.1 Define dry bond, angle iron, and corbel.

E6.9.2 Assemble materials, equipment, and tools required to lay a mantel.

E6.9.3 Outline procedure for laying a mantel.

E6.9.4 Determine dimensions from specifications.

E6.9.5 Lay out mantel.

E6.9.6 Dry bond bricks to given dimensions.

E6.9.7 Lay mantel to approximately 8" below damper.

E6.9.8 Secure and set angle iron with at least 8" bearing.

E6.9.9 Lay brick across angle iron.

E6.9.10 Corbel as necessary for mantel shelf.

CRITERION-REFERENCED MEASURE

C6.9 Mantel laid according to specifications; each corbel does not project more than 1 inch, and is straight, level, and plumb.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss corbeling and the need for corbeling in laying a mantel (E6.9.1).
2. Visit construction sites where fireplaces and brick mantels are being built. Allow students to observe, and if permissible, to ask questions (E6.9.1-E6.9.10).
3. Demonstrate laying mantel (E6.9.2-E6.9.10).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Plumb rule
Rule
Mason's line
Jointer
Safety hat
Brick
Mortar
Mortar board/stand
Mason's brush
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplace and Wood Stoves. Time-Life Books.
Kentucky CBVE Instructional Materials, MY-41. Division of Materials and Curriculum.
Masonry, Performance Objective 54. V-TECS.
Modern Masonry. Kicklighter.

Application

DUTY AREA

6. CONSTRUCTING CHIMNEY AND FIREPLACES

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

6.10 Construct firebox

COURSE

Masonry II (8513)

6.10

PERFORMANCE OBJECTIVE

P6.10 Given the necessary equipment, tools, supplies, and building specifications, construct a firebox. Joints must be filled and uniform, and dimensions must be exact according to plan.

SELECTED ENABLING OBJECTIVES

E6.10.1 Define: firebox, damper, flue-liner, fireback, air inlet, ash dump, firebuck, template, and parging.

E6.10.2 List tools and equipment required to build firebox.

E6.10.3 Outline procedure for laying out firebox.

CRITERION-REFERENCED MEASURE

C6.10 Firebox constructed according to building specifications; joints filled and uniform with dimensions exact according to plan.

SELECTED INSTRUCTIONAL ACTIVITIES

1. List, spell, and define terminology related to firebox construction (E6.10.1).
2. Discuss the purpose and construction of the firebox and the precautions the bricklayer must take to ensure its being fireproof (E6.10.1).
3. Demonstrate the procedure to be followed in laying a firebox, with special emphasis on filling joints (E6.10.2, E6.10.3).

SELECTED TOOLS AND MATERIALS

Trowel
Brick hammer
Brick set
Plumb rule
Rule
Mason's line
Square
Template

Brick
Mortar
Fire brick
Fire clay
Specifications

SELECTED AUDIOVISUAL MATERIALS

Slides: Bricklayer Training Series. Career Aids, Inc.

SELECTED REFERENCES

Fireplaces and Wood Stoves. Time-Life Books.
Masonry, Performance Objectives 55, 56, and 57. V-TECS.
Modern Masonry. Kicklighter.

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASKS/COMPETENCIES

7.1 Assign personnel to duty positions

7.2 Rate a worker's performance

7.3 Order equipment and supplies

7.4 Orient new employees or co-workers

7.5 Keep records of time sheets

7.6 Compute labor costs

7.7 Estimate time, material, and cost

7.8 Prepare contract for masonry work

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASK/COMPETENCY

7.1 Assign personnel to duty positions

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

7.1

PERFORMANCE OBJECTIVE

P7.1 Given an instructor-prepared list of workers, including a description of each worker's competencies and experience, and a list of jobs to be accomplished, assign personnel to duty positions by matching the workers with the appropriate jobs. At least 80% of the workers and jobs must be matched accurately.

SELECTED ENABLING OBJECTIVES

E7.1.1 Estimate time required to complete various bricklaying tasks.

E7.1.2 List worker competencies needed for spreading mortar, laying brick to line, building an outside corner, building a pier, and other basic bricklaying tasks.

E7.1.3 Identify factors to consider when assigning personnel to duty positions.

E7.1.4 Write a job description.

CRITERION-REFERENCED MEASURE

C7.1 Personnel assigned to duty positions on instructor-prepared worksheet with 80% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Invite a personnel director from a construction firm to talk with students about techniques used for employee selection (E7.1.3).
2. Discuss how job descriptions are written and allow students to practice writing job descriptions for jobs with which they are familiar (E7.1.1 - E7.1.4).
3. Have students keep a record of the time it takes them to complete assigned projects (E7.1.1).
4. Have students list skills necessary to complete specific tasks (E7.1.2).

SELECTED TOOLS AND MATERIALS

Sample job descriptions
Handout: Instructor-prepared worksheet

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: The Role of the Supervisor, Job Attitudes Program. Career Aids, Inc.

SELECTED REFERENCES

Masonry, Performance Objective 1. V-TECS.

Application

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASK/COMPETENCY

7.2 Rate a worker's performance

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

7.2

PERFORMANCE OBJECTIVE

P7.2 Given a checklist and a worker performing a masonry task, observe and rate worker's performance according to neatness, safety, selection and use of tools, efficiency, and masonry techniques. Ratings must agree with ratings given by instructor using the same checklist.

SELECTED ENABLING OBJECTIVES

E7.2.1 Cite OSHA safety standards for various masonry tasks.

E7.2.2 List tools needed to complete various masonry tasks.

E7.2.3 List reasonable times required to complete various masonry tasks.

E7.2.4 List the standard masonry practices required to complete specific masonry tasks.

E7.2.5 Identify criteria for rating the quality of masonry work.

CRITERION-REFERENCED MEASURE

C7.2 Worker's performance rated on checklist; ratings agree with those given by instructor.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Review OSHA safety standards (E7.2.1).
2. Have students observe demonstration on rating a building project. Discuss in detail the reasons for an acceptable or unacceptable rating (E7.2.1-E7.2.5).
3. Have students practice rating their building projects until their ratings are consistent with the rating of the instructor (E7.7.1-E7.2.5).

SELECTED TOOLS AND MATERIALS

List of OSHA safety standards
Checklists or rating forms

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	The Role of the Supervisor, Job Attitudes Program. Career Aids, Inc.

SELECTED REFERENCES

Masonry, Performance Objective 2. V-TECS.

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASK / COMPETENCY

7.3 Order equipment and supplies

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

7.3

PERFORMANCE OBJECTIVE

P7.3 Given a list of masonry equipment and supplies, a budget, and necessary catalogs and requisition forms, order equipment and supplies. Amount spent must not exceed the amount allocated, and requisition forms must be completed without error.

SELECTED ENABLING OBJECTIVES

E7.3.1 List criteria for completed requisition form. Include: a) supplier identification, b) completion of requisition heading, c) complete information on quantity, item description, and price, and d) signature.

E7.3.2 Fill in supplier information.

E7.3.3 Complete requisition heading.

E7.3.4 Complete information on quantity, item description, and price.

E7.3.5 Sign requisition form as directed.

E7.3.6 Prepare requisition forms for mailing and for files.

CRITERION-REFERENCED MEASURE

C7.3 Equipment and supplies ordered; order does not exceed budget and is completed without error.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Invite a construction supervisor to talk to students about the importance of ordering proper equipment and supplies at the least possible cost and in an expeditious manner (E7.3.1-E7.3.6).
2. Have students study several catalogs and prepare requisitions for various jobs (E7.3.1-E7.3.6).
3. Complete a requisition form with intentional errors in math, item descriptions, and quantities. Distribute to students and have them locate mistakes (E7.3.1-E7.3.6).

SELECTED TOOLS AND MATERIALS

Requistion forms
Purchase orders
Catalogs or cost information

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	Requisitions and Purchasing Orders, Retail Store Stockroom/Shipping. Singer Career Systems.

SELECTED REFERENCES

Masonry, Performance Objective 3. V-TECS.

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASK/COMPETENCY

7.4 Orient new employees or co-workers

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)
Masonry II (8513)

7.4

PERFORMANCE OBJECTIVE

P7.4 Given information on a selected masonry procedure and a simulated situation, prepare and present a 10-minute briefing to orient new employees or co-workers to the procedure. Eighty percent of the items on an instructor-prepared checklist must be rated acceptable.

SELECTED ENABLING OBJECTIVES

E7.4.1 Identify masonry topics suitable for a presentation to a group of new employees.

E7.4.2 List characteristics of an effective oral presentation.

E7.4.3 Identify necessary training aids.

CRITERION-REFERENCED MEASURE

C7.4 New employees or co-workers provided an orientation by the preparation and presentation of a 10-minute briefing on a selected masonry procedure; eighty percent of items on instructor's checklist rated acceptable.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Review and discuss characteristics of an effective oral presentation (E7.4.2).
2. Videotape or tape record students making practice presentations. Have students point out strengths and weaknesses of each presentation (E7.4.1-E7.4.3).
3. Provide students with a list of acceptable topics and discuss (E7.4.1).
4. Sponsor an in-class contest to determine the best presentation (E7.4.1-E7.4.3).

SELECTED TOOLS AND MATERIALS

Videotape recorder and tapes (if available)
Tape recorder
Training aids as required
Handout: Instructor-prepared checklist

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette: The Role of the Supervisor, Job Attitudes Program. Career Aids, Inc.

SELECTED REFERENCES

Masonry, Performance Objective 4. V-TECS.

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASK / COMPETENCY

7.5 Keep records of time sheets

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)
Masonry II (8513)

7.5

PERFORMANCE OBJECTIVE

P7.5 Given the necessary recording materials, keep records of time sheets by recording the name, hourly rate of pay, and total time worked for each assigned worker. All entries must be completed with 100% accuracy, and time record must be reported by the designated deadline.

SELECTED ENABLING OBJECTIVES

E7.5.1 Compute accurately, using decimals and fractions.

E7.5.2 Print legibly.

E7.5.3 Compute overtime at time-and-a-half and double time.

E7.5.4 Identify all information needed to complete time sheets.

CRITERION-REFERENCED MEASURE

C7.5 Records of time sheets completed with 100% accuracy and reported by the designated deadline.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Give review demonstration on how to calculate using decimals and fractions (E7.5.1).
2. Have students compute time-and-a-half and double time overtime (E7.5.3).
3. Prepare a practice set of time cards and have students fill them in. Have students practice using several different hours and hourly wages (E7.5.1 - E7.5.4).

SELECTED TOOLS AND MATERIALS

Time cards
Pen or pencil
Calculators (optional)
Recording cards

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

Mathematics. Masonry Trades. Lux and Welbs.

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASK/COMPETENCY

7.6 Compute labor costs

PROGRAM

MASONRY (46.0102)

COURSE

Masonry I (8512)
Masonry II (8513)

7.6

PERFORMANCE OBJECTIVE

P7.6 Given building specifications or a work order, the amount of work expected per worker per day, the number of assigned workers, and hourly pay rate, compute the total labor cost. Estimate must be completed with 95% accuracy.

SELECTED ENABLING OBJECTIVES

E7.6.1 Compute accurately, using percentages, decimals, and fractions.

E7.6.2 Determine productivity expectations for various masonry tasks.

E7.6.3 Describe procedure used in determining hourly pay rates for the bricklayer, the apprentice, and the laborer.

E7.6.4 Identify consequences of over- and under-estimating total labor cost for masonry work.

CRITERION-REFERENCED MEASURE

C7.6 Labor costs computed with 95% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Have students review math skills needed to compute accurately (E7.6.1).
2. Have students review job duties and pay rates for bricklayers, apprentices, and laborers (E7.6.2, E7.6.3).
3. Invite an estimator to visit the classroom. Have estimator demonstrate techniques for estimating labor cost and discuss ramifications of over- and under-estimating costs (E7.6.1-E7.6.4).
4. Have students practice preparing estimates of masonry work, using several different kinds of building projects (E7.6.4).

SELECTED TOOLS AND MATERIALS

Sample estimates
Estimating forms
Calculator (optional)
Work order

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	The Role of the Supervisor, Job Attitudes Programs. Career Aids, Inc.

SELECTED REFERENCES

Concrete Masonry Vocational Training. Toennies and Merten.
Mathematics. Masonry Trades. Lux and Welbs.

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

7.7 Estimate time, material, and cost

COURSE

Masonry II (8513)

7.7

PERFORMANCE OBJECTIVE

P7.7 Given the plans and specifications of a building project, estimate the time required to complete the project, the amount of materials needed, and the customer's cost. Estimate must be completed with 95% accuracy.

SELECTED ENABLING OBJECTIVES

E7.7.1 Define: labor productivity rate, take off, quantities, unit price, overhead, summary sheet, bid, and profit.

E7.7.2 Compute accurately, using decimals, fractions, and percentages.

E7.7.3 Investigate material costs from various suppliers.

E7.7.4 Identify factors to consider when estimating time.

CRITERION-REFERENCED MEASURE

C7.7 Time, material, and cost for building project estimated with 95% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss with students the step-by-step procedure for determining the customer's cost for a building project, with attention given to allowance for waste and profit (E7.7.1-E7.7.4).
2. Provide students with opportunity to work through several building project costs (E7.7.1 - E7.7.4).
3. Arrange for students to visit a construction site, estimate the cost, and compare it to the actual projected cost (E7.7.1-E7.7.4).

SELECTED TOOLS AND MATERIALS

Building specifications
Calculator (optional)

SELECTED AUDIOVISUAL MATERIALS

Filmstrip/Cassette:	Fractions and Decimals: On-The-Job Conversion, On-The-Job Measurements. Singer Career Systems.

SELECTED REFERENCES

The World of Construction. Lux and Welbs.
Mathematics-Masonry Trades. Lux and Welbs.

DUTY AREA

7. PERFORMING SUPERVISORY FUNCTIONS

TASK / COMPETENCY

7.8 Prepare contract for masonry work

PROGRAM

MASONRY (46.0102)

COURSE

Masonry II (8513)

7.8

PERFORMANCE OBJECTIVE

P7.8 Given job specifications, prepare a contract for masonry work. Contract must include description of work to be done, amount to be paid for work, estimated date of completion, and provision for dated signatures of both the customer(s) and the bricklayer/contractor.

SELECTED ENABLING OBJECTIVES

E7.8.1 Define basic legal terms relating to contracts.

E7.8.2 List the essential components of a contract.

E7.8.3 Differentiate between valid and invalid contracts.

E7.8.4 Explain the role of a notary public.

E7.8.5 List factors to consider when estimating completion date.

CRITERION-REFERENCED MEASURE

C7.8 Contract for masonry work prepared correctly and includes description of work to be done, amount to be paid for work, estimated date of completion, and provision for dated signatures of both the customer(s) and bricklayer/contractor.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Display sample copies of contracts for brick work. Discuss variations in each, such as degree of specificity, terminology used, and format (E7.8.1, E7.8.2).

2. Have students complete contracts for various kinds of masonry work, being careful to use different labor cost factors, materials, and job specifications (E7.8.1 - E7.8.5).

3. Invite a contractor to speak to class about various types of contracts (E7.8.1-E7.8.5).

SELECTED TOOLS AND MATERIALS

Sample contracts
Contract forms
Job specifications

SELECTED AUDIOVISUAL MATERIALS

None identified

SELECTED REFERENCES

None identified

DUTY AREA

8. GETTING AND KEEPING A JOB

TASKS/COMPETENCIES

8.1 Investigate career and job opportunities

8.2 Complete a job application form

8.3 Demonstrate effective interviewing skills

8.4 Identify qualities needed to keep a job

DUTY AREA

8. GETTING AND KEEPING A JOB

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

8.1 Investigate career and job opportunities

COURSE

Masonry II (8513)

8.1

PERFORMANCE OBJECTIVE

P8.1 Given classified ads, a copy of the Occupational Outlook Handbook, employment agency phone numbers (including State Employment Agency), and construction company phone numbers, investigate local career and job opportunities available in masonry by completing an instructor-prepared worksheet. All items must be rated acceptable.

SELECTED ENABLING OBJECTIVES

E8.1.1 Identify local job placement agencies.

E8.1.2 Ask concise, articulate, and relevant questions.

E8.1.3 Research information dealing specifically with brick masonry careers.

E8.1.4 Collect job advertisements from local newspapers.

CRITERION-REFERENCED MEASURE

C8.1 Job opportunities investigated; all items on an instructor-prepared worksheet rated acceptable.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Review study of job opportunities in the masonry field (E8.1.3).
2. Identify local career information centers and job placement agencies (E8.1.1).
3. Have students visit the career section of the school or local library to examine materials available on masonry careers (E8.1.3).
4. List and explain types of occupational information, such as salary or wages, hours, training or experience requirements, and fringe benefits (E8.1.2).
5. Have students collect, read, and interpret local advertisements for masonry jobs (E8.1.4).
6. Invite union or industry representatives to speak to students about current and long-range employment opportunities (E8.1.1-E8.1.4).

SELECTED TOOLS AND MATERIALS

Occupational Outlook Handbook
Sample job advertisements
Trade bulletins
Handout: Instructor-prepared worksheet

SELECTED AUDIOVISUAL MATERIALS

Film:	Careers in the Building Trades (80812). Virginia Department of Education.
Filmstrip/Cassette:	Job Seeking Skills, Packaging Your Skills. Singer Career Systems.

SELECTED REFERENCES

Entering the World of Work. Kimbrell and Vineyard.
Modern Masonry, pp. 209-214. Kicklighter.
You're Hired! Getting the Right Job for You. Learning Resources Center. Virginia Commonwealth University.

DUTY AREA

8. GETTING AND KEEPING A JOB

PROGRAM

MASONRY (46.0102)

TASK / COMPETENCY

8.2 Complete a job application form

COURSE

Masonry II (8513)

8.2

PERFORMANCE OBJECTIVE

P8.2 Given instructions, a personal data sheet (resume), and a blank application form, complete the application form. The application should be typed, or printed neatly in ink, and all sections of the application must be completed accurately.

SELECTED ENABLING OBJECTIVES

E8.2.1 Prepare a personal data sheet or resume.

E8.2.2 Explain the purpose of the job application.

E8.2.3 List types of information usually requested on a job application form.

CRITERION-REFERENCED MEASURE

C8.2 Job application form, typed or printed neatly in ink, filled out completely and accurately.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Invite a personnel department employee to discuss filling out application forms properly (E8.2.1-E8.2.3).
2. Display several different sample application forms and discuss similarities and differences (E8.2.3).
3. Have different application forms available for students to practice completing (E8.2.2, E8.2.3).

SELECTED TOOLS AND MATERIALS

Sample job application forms
Sample data sheets or resumes

SELECTED AUDIOVISUAL MATERIALS

Film: Your Job - Applying for It (42-609). Virginia Department of Education.
Filmstrip/Cassette: Application, Packaging Your Skills. Singer Career Systems.

SELECTED REFERENCES

Entering the World of Work. Kimbrell and Vineyard.
Modern Masonry, pp. 209-214. Kicklighter.
You're Hired! Getting the Right Job for You. Learning Resources Center. Virginia Commonwealth University.

DUTY AREA

8. GETTING AND KEEPING A JOB

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

8.3 Demonstrate effective interviewing skills

COURSE

Masonry II (8513)

8.3

PERFORMANCE OBJECTIVE

P8.3 Given a simulated job interview situation, demonstrate effective interviewing skills by role playing a job applicant in an interview with a prospective employer. All items on instructor's checklist must be rated acceptable.

SELECTED ENABLING OBJECTIVES

E8.3.1 Explain the importance of the interview.

E8.3.2 Prepare a list of suggestions to help an individual relax during an interview.

E8.3.3 Explain the meaning of "first impressions are lasting impressions."

E8.3.4 Identify traits and mannerisms that are effective, distracting, or objectionable during a job interview.

CRITERION-REFERENCED MEASURE

C8.3 Effective interviewing skills demonstrated in a role play situation with all items on instructor's checklist rated acceptable.

INSTRUCTOR'S CHECKLIST 8.3

DUTY: GETTING AND KEEPING A JOB

TASK: Demonstrate Effective Interviewing Skills

ACTIVITY: Role play the Applicant in a Job Interview

ITEM	RATING*	
	Acceptable	Unacceptable
1. Gave interviewer firm handshake and greeted him or her by last name.		
2. Did not sit until asked to do so.		
3. Was tactful, courteous, enthusiastic, confident, and honest.		
4. Spoke clearly and distinctly.		
5. Did not interrupt interviewer.		
6. Asked intelligent questions.		
7. Shared personal interests and hobbies (if asked).		
8. Shared past work experiences.		
9. Used correct grammar.		
10. Displayed good posture; smiled.		
11. Did not chew gum, smoke, or bite nails.		
12. Maintained eye contact with interviewer.		
13. Was pleasant and natural, but businesslike.		
14. Was realistic about salary.		

*All items must receive acceptable rating.

INSTRUCTOR'S CHECKLIST 8.3 (continued)

DUTY: GETTING AND KEEPING A JOB

TASK: Demonstrate Effective Interviewing Skills

ACTIVITY: Role play the Applicant in a Job Interview

ITEM	RATING*	
	Acceptable	Unacceptable
15. Thought before speaking; approached questions positively.		
16. Did not use slang or vulgar language.		
17. Had no odor of alcohol or nicotine on breath.		
18. Thanked interviewer for time.		

*All items must receive acceptable rating.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Set up role-playing situations. Invite a school guidance counselor to act as interviewer (E8.3.1-E8.3.4).
2. Videotape the role-playing situations. Have students discuss traits and mannerisms that are effective, distracting, or objectionable (E8.3.4).
3. Invite a personnel department employee to talk to students about the job interview (E8.3.1-E8.3.4).
4. Have students identify actions or mannerisms to avoid, such as smoking, chewing gum, slouching, using slang, and arriving late (E8.3.3, E8.3.4).

SELECTED TOOLS AND MATERIALS

Videotape recorder and tapes
Tape recorder and tapes
Handout: Instructor checklist

SELECTED AUDIOVISUAL MATERIALS

Film: Interview--Ready or Not. (07312) Virginia Department of Education.

Filmstrips/Cassettes: Personal Appearance, Interview, Packaging Your Skills. Singer Career Systems.

SELECTED REFERENCES

EFE/WECEP Instructional Materials Manual: Pre-Employment, pp. 467-547. Vocational and Adult Education, Virginia Department of Education.
Entering the World of Work. Kimbrell and Vineyard.
Modern Masonry, pp. 209-214. Kicklighter.
You're Hired! Getting the Right Job for You. Learning Resources Center. Virginia Commonwealth University.

DUTY AREA

8. GETTING AND KEEPING A JOB

PROGRAM

MASONRY (46.0102)

TASK/COMPETENCY

8.4 Identify qualities needed to keep a job

COURSE

Masonry II (8513)

8.4

PERFORMANCE OBJECTIVE

P8.4 Given a list of personal traits, identify those qualities or traits which are needed to keep a job on an instructor-prepared worksheet with 90% accuracy.

SELECTED ENABLING OBJECTIVES

E8.4.1 Define terms related to personality development, such as self-esteem, motivation, self-concept, trait, and attitude.

E8.4.2 Describe desirable personal traits.

E8.4.3 Describe undesirable personal traits.

CRITERION-REFERENCED MEASURE

C8.4 Qualities needed to keep a job identified on instructor-prepared worksheet with 90% accuracy.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Discuss key terms and concepts related to personality development (E8.4.1).
2. Using several case studies, have students discuss why a person loses a job, keeps a job, or is promoted in a job (E8.4.2, E8.4.3).
3. Organize a panel comprised of persons working in various areas of the masonry field to discuss personnel policies and to answer questions from students concerning career advancement (E8.4.1-E8.4.3).

SELECTED TOOLS AND MATERIALS

Handouts: Instructor-prepared worksheet
List of personal traits

SELECTED AUDIOVISUAL MATERIALS

Filmstrips/Cassettes: You and the Job Environment. Singer Career Systems.

SELECTED REFERENCES

Entering the World of Work. Kimbrell and Vineyard.
Modern Masonry, pp. 209-214. Kicklighter.
You're Hired! Getting the Right Job for You. Learning Resources Center. Virginia Commonwealth University.

SECTION 2.

PROGRAMS AND COURSES

The programs and courses described in this publication are based on the tasks analyses presented in the preceding section. All programs and courses have been approved by the Virginia Department of Education.

The first part of this section contains a description of the Masonry program, listings of program courses and options, and DOT job codes and titles related to the program.

Included in the second part of this section are descriptions of the secondary Masonry courses. Following the course description is a task/competency sequence which lists the tasks in a suggested instructional order for each course. A content outline for each course is also provided and is cross-referenced with the task inventory sheets to assist the instructor in identifying instructional objectives, materials, criterion standards, and reference materials.

SECONDARY PROGRAMS AND COURSES

PROGRAM TITLE: Masonry

DESCRIPTION: In the Masonry program, students are prepared to begin employment at the entry skill level. Students use, maintain, and handle safely the tools, machines, equipment, and materials used in the masonry trades.

CIP CODE: 46.0102

SUGGESTED GRADE LEVEL: 10 - 12

APPROVED COURSE	VA COURSE CODE	DOT CODE/TITLE
Masonry I	8512	861.381-018 Bricklayer 869.687-025 Bricklayer Helper 861.381-022 Bricklayer Apprentice
Masonry II	8513	861.381-018 Bricklayer

PROGRAM OPTIONS:

Option I: 8512, 8513

Option II: 8512, 8513, 8514, (Option II is designed for students grades 10-12. For additional information see the VEMS supplement, (Student Planning Guide.)

SOURCE: Vocational Education Student Planning Guide: VEMS Supplement.

MASONRY I (8512)

Description and Sequence

COURSE DESCRIPTION:	Masonry I is a triple-period class. Instruction is given to develop skills and technical knowledge for laying block and brick, reading blueprint and building specifications, performing straight wall work, and practicing basic recordkeeping procedures. Safety practices are emphasized constantly. All brick bonds are included in the instructional process.
PREREQUISITES:	None
SUGGESTED GRADE LEVEL	11

Task/Competency Sequence

1.1 Prepare for classroom instruction and activities
1.2 Identify job opportunities in the masonry field
1.3 Identify safety equipment and rules in the masonry shop
1.4 Use shop tools and machines safely
1.5 Participate in in-class activities of VICA
2.1 Apply basic mathematical concepts
2.2 Identify mason's tools
2.3 Read and interpret blueprints and specifications
2.4 Measure distance from reference points
2.5 Mark guidelines on working surface
2.6 Determine vertical and horizontal alignment
2.7 Identify sizes and kinds of brick
2.8 Identify sizes and kinds of block
2.9 Identify types of mortar
3.1 Set up work station
3.2 Proportion and mix mortar by hand
3.3 Mix lime mortar with power mixer
3.4 Use a trowel
3.5 Lay brick in common bond pattern
3.6 Lay a header course
3.7 Lay a rowlock course
3.8 Lay a soldier course
3.9 Lay a sailor course
3.10 Lay a shiner course

3.11 Build a wall in stack bond pattern
3.12 Build a wall in Flemish bond pattern
3.13 Tool concave joints
3.14 Build corners (outside/inside)
3.15 Tool rake joints
3.16 Tool v-joints
3.18 Cut a bat closure
3.19 Clean brick walls
3.20 Gauge masonry wall with story pole
5.2 Construct a jamb
5.7 Construct piers
5.8 Fasten brick veneer, using corrugated wall ties
7.4 Orient new employees or co-workers
7.5 Keep records of time sheets
7.6 Compute labor costs

COURSE OUTLINE

MASONRY I

I. ORIENTATION

	CODE
A. Classroom preparation	P1.1
B. Occupational information	P1.2
C. Safety equipment and rules	P1.3
D. Machine and tool safety	P1.4
E. VICA participation	P1.5

II. BASIC MASONRY SKILLS

A. Mathematical concepts	P2.1
B. Mason's tools	P2.2
C. Blueprints and specifications	P2.3
D. Distance measurements	P2.4
E. Guideline marking	P2.5
F. Horizontal and vertical alignment	P2.6
G. Brick identification	P2.7
H. Block identification	P2.8
I. Mortar identification	P2.9

III. LAYING, POINTING, AND JOINTING SKILLS

A. Work station	P3.1
B. Mortar mixing--hand	P3.2
C. Mortar mixing--machine	P3.3
D. Trowel skills	P3.4
E. Common bond pattern	P3.5
F. Header course	P3.6
G. Rowlock course	P3.7
H. Soldier course	P3.8
I. Sailor course	P3.9
J. Shiner course	P3.10
K. Stack bond pattern	P3.11
L. Flemish bond pattern	P3.12
M. Concave joints	P3.13
N. Corners	P3.14
O. Rake joints	P3.15
P. V-joints	P3.16
Q. Bat closure	P3.18
R. Cleaning procedures	P3.19
S. Story pole	P3.22

IV. BRICK STRUCTURES

A. Jamb construction	P5.2
B. Pier construction	P5.7
C. Wall ties	P5.8

V. SUPERVISORY FUNCTIONS

A. Co-worker orientation	P7.4
B. Time sheets	P7.5
C. Labor costs	P7.6

MASONRY II (8513)

Description and Sequence

COURSE DESCRIPTION: Students are given additional instruction in the manipulative skills and technical knowledge for mixing and pouring concrete, building specialized patterns, designing and building fireplaces and chimneys, and other required competencies for masonry workers.

PREREQUISITES: Masonry I

SUGGESTED GRADE LEVEL: 12

TASK/COMPETENCY SEQUENCE

1.1 Prepare for classroom instruction and activities
1.2 Identify job opportunities in the masonry field
1.3 Identify safety equipment and rules in the masonry shop
1.4 Use shop tools and machines safely
1.5 Participate in in-class activities of VICA
2.1 Apply basic mathematical concepts
2.2 Identify mason's tools
2.3 Read and interpret blueprints and specifications
3.3 Mix lime mortar with power mixer
3.5 Lay brick in common bond pattern
3.6 Lay a header course (full)
3.11 Build a wall in stack bond pattern
3.12 Build a wall in Flemish bond pattern
3.20 Lay running bond pattern in concrete masonry
3.21 Lay vertical bond pattern in concrete masonry
3.13 Tool concave joints
3.14 Build corners (outside/inside)
3.17 Point a wall
3.19 Clean brick walls
3.22 Gauge masonry walls with story pole
3.23 Lay specialized patterns
4.1 Mix and pour concrete
4.2 Set up batter boards
4.3 Construct wall containing pilasters
5.1 Construct a partition
5.3 Construct sills (rowlock)
5.4 Set lintels
5.5 Set window
5.6 Lay a flight of steps
6.1 Erect scaffolding
6.2 Build a double face chimney (smoke chamber)
6.3 Build a single face chimney (smoke shelf)
6.4 Cut a flue lining
6.5 Install ash dump
6.6 Install clean-out door

6.7 Insert a damper
6.8 Lay a hearth
6.9 Lay a mantel
6.10 Construct firebox
7.1 Assign personnel to duty positions
7.2 Rate a worker's performance
7.3 Order equipment and supplies
7.4 Orient new employees or co-workers
7.5 Keep records of time sheets
7.6 Compute labor costs
7.7 Estimate time, material, and cost
7.8 Prepare contract for masonry work
8.1 Investigate career and job opportunities
8.2 Complete a job application form
8.3 Demonstrate effective interviewing skills
8.4 Identify qualities needed to keep a job

COURSE OUTLINE

MASONRY II

I.	ORIENTATION	CODE
	A. Classroom preparation	P1.1
	B. Occupational information	P1.2
	C. Safety Equipment and rules	P1.3
	D. Machine and tool safety	P1.4
	E. VICA participation	P1.5
II.	BASIC MASONRY SKILLS	
	A. Mathematical concepts	P2.1
	B. Mason's tools	P2.2
	C. Blueprints and specifications	P2.3
III	LAYING, JOINTING, AND POINTING SKILLS	
	A. Mortar mixing--machine	P3.3
	B. Common bond pattern	P3.5
	C. Header course	P3.6
	D. Stack bond pattern	P3.11
	E. Flemish bond pattern	P3.12
	F. Concave joints	P3.13
	G. Corners	P3.14
	H. Pointing procedures	P3.17
	I. Cleaning procedures	P3.19
	J. Block running bond pattern	P3.20
	K. Block vertical bond pattern	P3.21
	L. Story pole	P3.22
	M. Specialized patterns	P3.23
IV.	FOUNDATIONS AND FOOTINGS	
	A. Mixing and pouring procedures	P4.1
	B. Batter boards	P4.2
	C. Pilasters	P4.3
V.	BRICK STRUCTURES	
	A. Partitions	P5.1
	B. Sills	P5.3
	C. Lintels	P5.4
	D. Windows	P5.5
	E. Steps	P5.6
VI.	CHIMNEYS AND FIREPLACES	
	A. Scaffolds	P6.1
	B. Double face chimney	P6.2
	C. Single face chimney	P6.3
	D. Flue lining	P6.4
	E. Ash dump	P6.5

VI. (continued)

F.	Clean-out door	P6.6
G.	Damper	P6.7
H.	Hearth construction	P6.8
I.	Mantel construction	P6.9
J.	Firebox construction	P6.10

VII. SUPERVISORY FUNCTIONS

A.	Personnel assignments	P7.1
B.	Performance ratings	P7.2
C.	Equipment and supply orders	P7.3
D.	Co-worker orientation	P7.4
E.	Time sheets	P7.5
F.	Labor costs	P7.6
G.	Estimates	P7.7
H.	Contracts	P7.8

VIII. CAREER AWARENESS

A.	Job opportunities	P8.1
B.	Job applications	P8.2
C.	Interviewing skills	P8.3
D.	Personal awareness	P8.4

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APPENDICES

APPENDIX A--Tools and Equipment List
APPENDIX B--Audiovisual Materials

APPENDIX C--Suggested Masonry Projects

APPENDIX D--Instructional Management System

APPENDIX A

Tools and Equipment List

The following tools and equipment have been listed for instructional and facility development.

Ash dump door
Clean-out door
Damper
Acid brushes
Bricklayer brushes
Wire brushes
Combination brush and scraper
Carborundum blades
Diamond blades
Block and tackle
Block jointer
Bricklayer jointer, rake
Bricklayer jointer, round
Bricklayer jointer, sled runner
Bricklayer jointer, V
Bricklayer jointer, weather
Brick sets
Cement center groovers
Blocking chisels
Cold chisels
Pointing chisels
Compass
Extension cord
Corner poles
Crow bars
Bolt cutter
Flat bed barrow
Rubber floats
Wooden floats
Cotton gloves
Rubber gloves
Goggles
Brick hammers
Claw hammer
Square point shovels (short handle)
Side walk scraper
Tin snips
Framing squares
Tri square
Star drills
Tile hammer
Sledge hawks
Plastering hawks
Mortar hoes
Rubber hoses
Jitterbug
Wooden level (brass bound)
Wooden level (metal trim)
Contractor's level
Line block
Chalk line
Mason's line
Nylon line
Mortar boards
Mortar box
Mortar mixer
Mattock pick
Diagonal cutting pliers
Utility pliers
Manila rope
Brickspacing rules
Modular rules
Plumb rule
Safety hats
Hand saw
Masonry saw
Electric saw (portable)
Flat-blade screwdrivers
Phillips screwdrivers
Scutch
Sharp shooter shovel
Round point shovels (long handle)
Square point shovels (long handle)
Notch trowel
Power drill
Tractor
Transit
Chains
Bucking tongs
Lumber - 2 x 4

Steel tape, 100'
Steel tape, 50'
Rubbing stones (with handles)
Hand tampers
Brick tongs
Story pole
Brick trowels
Plastering trowels
Pointed trowels
Tuck pointers (assorted)
Vise grips
Wheelbarrows
Wrecking bar
Adjustable wrench
Open end wrenches
Forklift
Scaffolds
Scaffolding boards
Steel reinforcement/Dura-Wall
Marking keel
Target stakes
Lintels
Template
Manual lift pulley
Truck
Brooms
Line pins
Line twigs
Line levels
Bulldozer
Hacksaw

APPENDIX B

SELECTED AUDIOVISUAL MATERIALS

American Association for Vocational Instructional Materials
Driftmier Engineering Center
Athens, Georgia 30602

Developing Shop Safety Skills

Audiovisual Services
Virginia Department of Education
P.O. Box 6Q
Richmond, Virginia 23216

1. Careers in the Building Trades (80812)
2. Elements of Brickwork (09710)
3. Interview--Ready or Not (07312)
4. Safety in the Shop--Basic Practices (37310)
5. Your Job--Applying for It (42609)

Career Aids, Inc.
8950 Lurline Avenue
Chatsworth, California 91311

1. Basic Measurement Math
2. Bricklayer Training Series
3. Building Construction Exterior
4. Completing the Exterior
5. Foundations
6. Job Attitudes Program
7. Masonry

Circle Oak Productions
RD #1, Girdle Ridge Drive
Katonah, New York 10536

Foundations

DCA Educational Products
424 Valley Road
Warrington, Pennsylvania 18976

1. Bonds-Some Traditional Patterns
2. Laying Block to the Line
3. Masonry
4. Masonry Tools
5. Masonry Walls
6. Porches
7. Simple Pattern Bonds
8. Steps

The Kenalex Corporation
2960 South Fox Street
Englewood, Colorado 80110

1. Here's How: Basic Bricklaying
2. Here's How: Basic Blocklaying
3. Here's How: Laying of Headers, Rowlocks, and Soldiers

Prentice-Hall Media
150 White Plains Road
Tarrytown, New York 10591

1. Advanced Masonry Skills
2. Basic Masonry Skills
3. Blueprint Reading Skills
4. Safety at Work
5. Safety in Residential Construction

School Media Associates
2620 Caladium Drive
Atlanta, Georgia 30329

1. Basic Brick Terminology and Construction
2. Brick Positions; Bonds; Wall ties
3. Building Lines and Batter Boards
4. Fireplaces, Floors, and Interior Brickwork
5. Fireplaces and Chimneys (masonry construction)
6. Mixing Mortar
7. Mortar Types
8. Pouring Concrete Foundation Walls
9. Safe Practices for the Mason

Singer Career Systems
80 Commerce Drive
Rochester, New York 14623

1. Exterior Construction
2. Masonry
3. On-the-Job Measurements
4. Packaging Your Skills
5. Retail Store Stockroom/Shipping
6. You and Your Environment

Structural Clay Products Institute
1750 Old Meadow Road
McLean, Virginia 22101

Basic Bricklaying

VICA State Advisor
Virginia Department of Education
P.O. Box 6Q
Richmond, Virginia 23216

VICA: Going All the Way.

APPENDIX C

SUGGESTED MASONRY PROJECTS

I. LAYING, JOINTING, AND POINTING PROJECTS

A. Masonry I

1. 4" wall with established lead or corner pole
2. Outside 4" corner lead, running bond
3. American bond corner lead, 8"
4. American bond inside corner lead, 8"

B. Masonry II

1. 12" composite wall, American bond
2. American bond corner lead, 12"
3. Flemish bond, 8"
4. Veneer wall with block backing
5. Inside corner lead--Flemish bond, 12"
6. Flemish bond corner lead with American bond backing, 12"
7. American bond wall, 4" x 8" vertical chase, 12"
8. 8" block corner lead
9. American bond lead with plumb jamb, 8"

II. BRICK AND CONCRETE CONSTRUCTION PROJECTS

A. Masonry I or II

1. 24" x 24" hollow pier on concrete base
2. 16" x 16" hollow pier on concrete base
3. 12" x 12" solid pier on concrete base

B. Masonry II

1. Brick windoow sill
2. 8" x 16" tee pier on concrete base
3. 8" x 16" L pier on concrete base
4. 8" wall with 8" x 12" pilaster on concrete base
5. 8" wall with 4" x 16" pilaster on concrete base

III. ARCHES AND COLUMNS

A. Masonry II

1. Roman arch
2. Soldier arch
3. Corner column
4. Rectangular column
5. Round column
6. Square column

IV. MISCELLANEOUS MASONRY WORK

A. Masonry II

1. Planters
2. Flashing installation
3. Masonry floors
4. Masonry walks
5. Ornamental lattice patterns
6. Clay tile work
7. Masonry repairs

APPENDIX D

Instructional Management System

VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

Page 1 of 2

STUDENT'S NAME
PROGRAM MASONRY
CIP CODE 46.0102
COURSE MASONRY I
SCHOOL
INSTRUCTOR

	DATE COMP.	GRADE	Bricklayer Helper 869.687 - 026	Bricklayer Apprentice 861.381 - 022	Bricklayer 861.381 - 018							
Use shop tools and machines safely			X	X	X							
Apply basic mathematical concepts			X	X	X							
Identify mason's tools			X	X	X							
Read and interpret blueprints and specifications				X	X							
Measure distance from reference points					X							
Mark guidelines on working surface				X	X							
Determine horizontal and vertical alignment				X	X							
Identify sizes and kinds of brick			X	X	X							
Identify sizes and kinds of block			X	X	X							
Identify types of mortar			X	X	X							
Set up work station			X	X	X							
Proportion and mix mortar by hand			X	X	X							
Mix lime mortar with power mixer			X	X	X							
Use a trowel				X	X							
Lay brick in a common bond pattern				X	X							
Lay a header course				X	X							

VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

Page 2 of 2

STUDENT'S NAME

PROGRAM MASONRY

CIP CODE 46.0102

COURSE MASONRY I

SCHOOL

INSTRUCTOR

	DATE COMP.	GRADE	Bricklayer Helper 869.687 - 026	Bricklayer Apprentice 861.381 - 022	Bricklayer 861.381 - 018							
Lay a rowlock course				X	X							
Lay a soldier course				X	X							
Lay a sailor course				X	X							
Lay a shiner course				X	X							
Build a wall in stack bond pattern				X	X							
Build a wall in Flemish bond pattern				X	X							
Tool concave joints				X	X							
Build corners (outside/inside)				X	X							
Tool rake joints				X	X							
Tool V-joints				X	X							
Cut a bat closure				X	X							
Clean brick walls			X	X	X							
Gauge masonry wall with story pole				X	X							
Construct a jamb				X	X							
Construct piers				X	X							
Fasten brick veneer using corrugated wall ties				X	X							

VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

Page 1 of 3

STUDENT'S NAME ______________________

PROGRAM MASONRY

CIP CODE 46.0102

COURSE MASONRY II

SCHOOL ______________________

INSTRUCTOR ______________________

	DATE COMP.	GRADE	Bricklayer Helper 869.687 - 026	Bricklayer Apprentice 861.381 - 022	Bricklayer 861.381 - 018							
Use shop tools and machines safely			X	X	X							
Apply basic mathematical concepts			X	X	X							
Identify mason's tools			X	X	X							
Read and interpret blueprints and specifications				X	X							
Mix lime mortar with power mixer			X	X	X							
Lay brick in a common bond pattern				X	X							
Lay a header course				X	X							
Build a wall in stack bond pattern				X	X							
Build a wall in Flemish bond pattern				X	X							
Tool concave joints				X	X							
Build corners (outside/inside)				X	X							
Point a wall				X	X							
Clean brick walls			X	X	X							
Lay running bond pattern in concrete masonry				X	X							
Lay vertical bond pattern in concrete masonry				X	X							
Gauge masonry wall with story pole				X	X							

VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

STUDENT'S NAME

PROGRAM MASONRY

CIP CODE 46.0102

COURSE MASONRY II

SCHOOL

INSTRUCTOR

	DATE COMP.	GRADE	Bricklayer Helper 869.687 - 026	Bricklayer Apprentice 861.381 - 022	Bricklayer 861.381 - 018							
Lay specialized patterns					X							
Mix and pour concrete			X	X	X							
Set up batter boards			X	X	X							
Construct wall containing pilasters				X	X							
Construct a partition				X	X							
Construct sills				X	X							
Set lintels				X	X							
Set window				X	X							
Lay a flight of steps				X	X							
Erect scaffolding			X	X	X							
Build a double face chimney				X	X							
Build a single face chimney				X	X							
Cut a flue lining				X	X							
Install ash dump				X	X							
Install clean-out door				X	X							
Insert a damper				X	X							

VIRGINIA T&I INSTRUCTIONAL MANAGEMENT SYSTEM

Page 3 of 3

STUDENT'S NAME

PROGRAM MASONRY

CIP CODE 46.0102

COURSE MASONRY II

SCHOOL

INSTRUCTOR

	DATE COMP.	GRADE	Bricklayer Helper 869.687 - 026	Bricklayer Apprentice 861.381 - 022	Bricklayer 861.381 - 018							
Lay a hearth				X	X							
Lay a mantel				X	X							
Construct firebox				X	X							

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